

Report to the Board of Fisheries

SHELLFISH

PART I

- Red and Blue King Crab Fisheries ■
- Brown King Crab Fisheries ■
- Southeast Alaska Tanner Crab Fisheries ■
- Yakutat Tanner Crab Fisheries ■



ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
JUNEAU, ALASKA

REGIONAL INFORMATION
REPORT NO. 1/92-18
DECEMBER 1992

Southeast Alaska-Yakutat Region

1991/92

REPORT TO THE BOARD OF FISHERIES
1991/92 REGION 1 SHELLFISH FISHERIES



Regional Information Report No.¹ 1J92-18

Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska

December 1992

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REPORT TO THE BOARD OF FISHERIES
INTRODUCTION TO 1991/92 SHELLFISH FISHERIES: PART I



By

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Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska

December 1992

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INTRODUCTION

This report reviews the commercial shellfisheries of Region 1 (Southeast Alaska - Yakutat) of the Division of Commercial Fisheries. Region 1 consists of shellfish Registration Areas A (Southeast Alaska) and D (Yakutat) (Figure 1). Statistical Area A encompasses all state waters within the Alexander Archipelago and off the outer coastline northwest to Cape Fairweather. Waters of Statistical Area A are divided into Statistical Districts 1 through 16. Statistical Area D includes all state waters from Cape Fairweather to Cape Suckling, and is divided into Statistical Districts 181 through 191. Most shellfisheries in both areas occur in state waters; however, some fisheries (and attendant state management authority) extend into the U.S. Exclusive Economic Zone (EEZ).

Region 1 shellfish harvests for the last completed season totaled 15,240,000 lbs of combined product, worth an estimated \$19,710,000, at the exvessel level (Table 1). In descending order, the top five fisheries by weight were; Southeast Dungeness crab, Southeast beam trawl shrimp, Yakutat Dungeness crab, Southeast Tanner crab, and Southeast sea cucumbers. The top five fisheries by exvessel value were; Southeast Dungeness crab, Yakutat Dungeness crab, Southeast Tanner crab, Southeast pot-caught shrimp, and Yakutat weathervane scallops.

Many shellfisheries are fully developed. Some stocks are sustaining fisheries with considerable resiliency and their current management is considered adequate. Others are locally depressed by past high effort levels, natural fluctuations, or a combination of both. Most distressed stocks are closed (e.g., Southeast red king crab) or under restrictive management (e.g., Southeast brown king crab, Yakutat Tanner crab). Southeast red king crab stocks appear to be slowly rebuilding. Southeast brown king crab are at lower levels of abundance than at any time in the past decade. Yakutat Tanner crab appear to be stable, with no obvious signs of recovery to historically high levels. In response to an increasing need for comprehensive management strategies for these fisheries, the department has drafted management plans for Southeast Alaska Tanner and king crabs.

Other fisheries are in very early stages of development (e.g., the sea cucumber fishery). In this fishery, and on-going exploratory fisheries for red sea urchin, littleneck clams, and horse clams, the primary management strategy has been to restrict harvest to levels that are assumed to be very conservative and to use the harvest data to develop comprehensive fisheries management plans.

During the past decade, participation and effort levels in most old and new fisheries have significantly increased, in some cases by an order of magnitude. This trend will probably continue, even in limited fisheries, as permit holders capitalize to the economically viable limit, and it is causing increased concern.

for the future of many existing commercial and non-commercial fisheries, as well as the possible fate of newly emerging fisheries.

Shellfish Research in Region 1

Possibly the single most important research project in Region 1 has been an annual survey to assess the abundance of red king crab in important bay areas of northern Southeast Alaska. The attainment of the threshold level and the allowable harvest is estimated from survey data. Without the survey, estimation of either is difficult and no commercial fishery is permitted. This project has provided a fairly continuous time series of data since 1978. However, since 1986, funding constraints have limited these surveys. In an effort to supplement survey data, test fishing using commercial vessels was unsuccessfully attempted in 1988. The future of the red king crab commercial fishery will depend on funding for the traditional survey, or development of alternate methods to estimate the allowable harvest.

Some Tanner crab stock composition information has been collected incidentally during red king crab index surveys. Such information is the extent of stock composition data available for sublegal male and female Tanner crabs in Region 1.

Information on Tanner bitter crab disease has been collected for three years from a number of important Tanner crab fishing grounds, either during the red king crab survey or from commercial catches at dockside. This research has provided data on infection rates and geographic distribution of the disease. During the winter of 1991/92, the department also conducted a cooperative research project on the seasonal marketability of infected crab. Preliminary results suggest that any change in management made on the basis of marketability of bitter crab involves tradeoffs that require careful consideration.

Limited biological data for spot shrimp and pink shrimp is being collected and analyzed by dockside and on-board catch sampling in Southeast Alaska. The data is used to assess the effects of beam trawling on stock abundance and composition. A pink shrimp and sidestripe shrimp population estimate using the area-swept method was briefly accomplished biennially in Yakutat Bay from 1980 through 1984, with the exception of 1983. The data was used to set allowable harvest levels in Yakutat Bay.

Over the past decade, department SCUBA divers have conducted increasingly extensive assessment surveys to collect density and size frequency information on abalone, sea cucumbers and geoducks. The more recent surveys have concentrated on sea cucumbers. The resulting data has been used to estimate stock structure, abundance, and allowable harvest levels for these species. This research was initially on an opportunistic basis as the information was needed for management. It was partially funded once by

the legislature for fiscal year 1989. A grant through the Pacific States Fisheries Management Commission is currently being used to support assessment research for red sea urchins.

Shellfish Management in Southeast Alaska and Yakutat

In addition to these management-related research projects, dockside sampling, largely limited to the crab and shrimp fisheries, provides a consistent time series of size frequency and shell condition data. It also provides the only biological and catch and effort information available for most species of shellfish.

A limited amount of on-board sampling is conducted in the Dungeness crab fisheries of Southeast Alaska and Yakutat. Some aerial surveys are conducted during the summer season in Southeast Alaska to document effort on important fishing grounds. If funds are available, limited aerial surveys may be flown during Tanner crab fisheries to assess specific problems.

In other fisheries for which less data is available, management is limited to an analysis of historic fishery information, current effort levels, current market conditions, in-season harvest data, and reviews of published information. With these tools, management can only make broad inferences about actual stock conditions. Given these limitations, the state is often reduced to reacting to perceived problems as quickly as possible. This is often not enough to assure sustained yield management.

Shellfish Staff

The management and research programs for crabs, shrimp, scallops, octopus, and squid is headed by a Fisheries Biologist III, with two assistants and the occasional participation by area management staff. Staff members whose normal full-time assigned duties relate to these, and other pot shellfisheries include: Timothy Koeneman, Region 1 Shellfish Biologist located in Petersburg; Catherine Botelho, Assistant Region 1 Shellfish Biologist, Fishery Biologist II located in Douglas; Kenneth Imamura, Assistant Region 1 Shellfish Biologist, Fishery Biologist II, located in Douglas; and Rexanne Stafford, Fisheries Technician II port sampler for 8 months each year, located in Petersburg. Biometric support is provided by Doug Woodby and John E. Clark, Biometricians located in Douglas.

Fisheries for sea cucumber, sea urchin, geoduck, abalone, and other miscellaneous species are cooperatively managed by the Regional Management Coordinator and Area Management Biologists and their assistants. Stock assessment research is conducted by a Fisheries Biologist III, with assistance from other management staff.

Staff members include Doug Mecum, Region 1 Fisheries Coordinator, Fishery Biologist IV, located in Douglas; Don House, Assistant Area Management Biologist, Fishery Biologist II, located in Ketchikan; Bob DeJong, Area Management Biologist, Fishery Biologist III, located in Sitka; Bill Davidson, Assistant Area Management Biologist, located in Sitka; Bob Larson, Herring/Miscellaneous Species Project Leader, Fishery Biologist III located in Petersburg; Catherine Robinson, Stock Biology port sampler, Fishery Biologist I, located in Petersburg, and other regional and area staff members. Biometric support is provided by Doug Woodby, Biometrician II, located in Douglas.

Credits

The introduction and king crab reports under this cover were written by Timothy Koeneman. The Tanner crab reports were written by Kenneth Imamura. Catherine Botelho completed the major portion of the data summaries and tables included within each of these reports. Robert Larson was responsible for miscellaneous species. Gary Gunstrom edited the manuscripts, and Marla Trollan was responsible for formatting the final drafts.

Table 1.

Statistical Area (Southeast Alaska) and Statistical Area D (Yakutat) list of fisheries, harvest and approximate exvessel values from the last completed season or calendar year.

Season or Year	Fishery	Harvest in Thousands of Pounds	Approximate Ex-vessel Value in Thousands of \$\$ ^{a/}
1991/92	Red & Blue King Crab	1.7	6.4
1991/92	Brown King Crab	225.9	847.1
1991/92	Southeast Tanner Crab	2,108.6	3,162.9
1991/92	Yakutat Tanner Crab	38.0	47.5
1991/92	Southeast Dungeness Crab	4,662.4	6,061.1
1991/92	Yakutat Dungeness Crab	2,852.0	4,135.4
1991/92	Shrimp Beam Trawl	2,931.8	733.6
1991/92	Pot Shrimp	667.3	2,135.4
1991/92	Abalone	44.0	264.0
1991	Weathervane Scallops	442.4	1,460.0
1991	Sea Urchins	174.2	52.3
1991	Octopus	12.1	13.3
1991	Geoduck	247.6	123.8
1991 ^{b/}	Sea Cucumbers	831.7	665.4
1991	Littleneck Clams	4.7	15.3
Total		15,244.4	19,708.2

* Where number of vessels participating is three or less, the information is considered confidential.

^{a/} This column is calculated from the average price per pound of all tickets having values indicated on them.

^{b/} Number of pounds of sea cucumbers is approximated due to different processing methods. Number of sea cucumbers = 1,848,222.

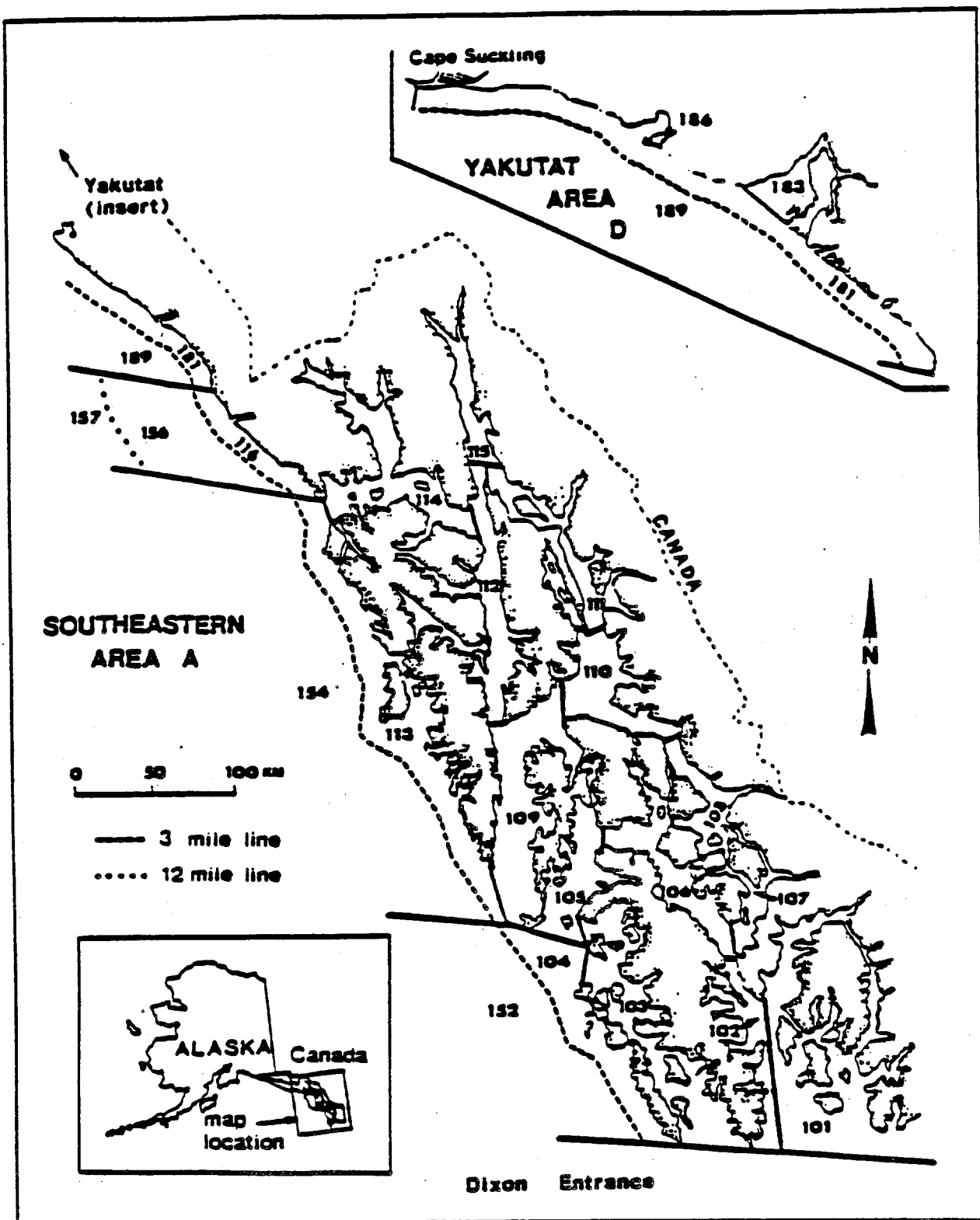


Figure 1. Map of Statistical Area A (Dixon Entrance to Cape Fairweather) and Statistical Area D (Cape Fairweather to Cape Suckling).

REPORT TO THE BOARD OF FISHERIES
1991/92 SOUTHEAST ALASKA-YAKUTAT
RED AND BLUE KING CRAB FISHERIES



By

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December 1992

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INTRODUCTION

This chapter of the Region 1 shellfish report describes the commercial red and blue king crab fisheries in Southeast Alaska (Statistical Area A) and Yakutat (Statistical Area D), with emphasis on activities which occurred during the 1991/92 fishing season. A review of the red and blue king crab fisheries is presented through a discussion of harvest and effort history, regulation development, and available research information.

Red and blue king crab, *Paralithodes camuschatica*, and *P. platypus*, are harvested in the protected bays, inlets, and adjacent shorelines of straits and sounds of the northern waters of Southeast Alaska at depths of less than 150 fathoms. Important red king crab fishing grounds are located in bays which open into Frederick Sound, Stephens Passage, Seymour Canal, Icy Strait, and Peril Strait. Red king crab are the target species, with small quantities of blue king crab harvested incidentally to red or brown king and Tanner crab fisheries. Small numbers of red and blue king crab are harvested in the southern portions of Southeast Alaska and Yakutat areas.

Vessels which participate in these fisheries are primarily salmon tenders, 58' salmon seine vessels, and larger gillnet vessels. Gear has gradually evolved to include side-loading king crab pots (7' x 7' x 30"), and top-loading pyramid or conical style king crab gear.

The current red king crab management approach is based on concepts which include fishing seasons intended to avoid fishing during sensitive life history stages, the harvest of only male crab, separate minimum legal carapace widths for each species (7 inches for red king crab and 6.5 inches for blue king crab), gear restrictions, a limited entry program, and a seasonal guideline harvest level based on survey results. Regulations in the Southeast Alaska blue king crab fishery and the Yakutat red and blue king crab fishery are generally the same as those for red king crab with the exception that guideline harvest ranges are not used. Specific grounds in Southeast Alaska are open to blue king crab fishing during open red and brown king crab, and Tanner crab fisheries.

FISHERY DEVELOPMENT AND HISTORY

Southeast Alaska Red and Blue King Crab Fishery

Commercial king crab fishing in Southeast Alaska waters was initially documented in 1960 when a small harvest occurred in the Petersburg-Wrangell Management Area. During the 1961 through 1968 period, harvests averaged less than 900,000 lbs per year, with an average of less than nine vessels participating during each fishing season (Table 1). During this first decade of fishing the peak calendar year harvest of 2,199,772 lbs by 19 vessels occurred in 1968. In 1969 effort increased to 39 vessels, but the resulting harvest declined to 1,899,930 lbs. It is important to note that regulations in effect during this period were very liberal and included a smaller minimum legal size than the current level.

Harvest information was first collected on a seasonal basis in the fall of 1970 at the beginning of the 1970/71 fishing season, which extended through the spring of 1971. Species composition during the early 1970s (Table 1) were estimated from comments included in early area management reports or informal fish ticket logs which state that red king crab made up the majority of the harvest. From the 1970/71 through the 1974/75 seasons, harvests averaged 453,436 lbs of red king crab and effort averaged 22 vessels each season. The first emergency order closure occurred in January, 1971 when the harvest for the 1970/71 fishing season totaled only 221,369 lbs after 4 1/2 months of fishing by 20 vessels. This was also the first year that the minimum legal size was increased to 7.0 inches in carapace width.

Accurate species information was required on fish tickets beginning in January, 1976. From the 1975/76 through the 1984/85 fishing seasons an average of 53 vessels/permits provided average seasonal harvests of 420,900 lbs of red and blue king crab. This represented an approximate ex-vessel value of \$1,040,300 (adjusted to the 1990 consumer price index). The peak harvest of 670,859 lbs occurred during the 1979/80 season when 43 vessels participated. A harvest of only 320,259 lbs occurred during the 1983/84 season when a peak effort of 103 vessels participated (Table 1). The last open season occurred during the 1984/85 season when 276,710 lbs were taken by 98 vessels during a seven day fishery in October. This last fishery represented an ex-vessel value of \$1,042,141 (also adjusted to the 1990 consumer price index).

Southeast Alaska Blue King Crab Fishery

During the past six fishing seasons, opportunities to harvest blue king crab have been provided by emergency order in five areas with known concentrations of blue king crab. These areas are Holkam Bay,

Port Snettisham, Taku Inlet, upper Lynn Canal, and Glacier Bay. To date these opportunities have resulted in total season harvests of less than 9,000 lbs by as many as 19 vessels. Most of this harvest occurs incidentally to directed brown king and Tanner crab harvests.

Yakutat Red and Blue King Crab Fishery

Harvests and effort in this fishery have been relatively low and intermittent. Since 1969, there have been reported harvests during six seasons, with a maximum of four participating vessels, and resulting harvests have averaged only 4,200 lbs. The highest harvests on record are less than 10,000 lbs. Both red and blue king crab have been landed, but the most consistent population in the area is the Russell Fjord blue king crab population.

REGULATION DEVELOPMENT

Fishing Seasons

From 1961 through 1968 there was no closed season. Prior to the 1969/70 king crab fishing season, a closed season from March 16 through August 14 was established. A fishing season of September 1 through January 31 was established in 1971 to provide a closure during the molting and mating season, during a portion of the aggregation period prior to the molting and mating season, and during the major growth period when recovery rates would be unacceptable to industry. Opening dates, within the September 1 through January 31 biological window, have been set by the Alaska Board of Fisheries based upon industry and department recommendations. Since 1979 season length has been based upon population survey results. The last fishing season for red king crab opened on October 10, 1984 and closed 7 days later.

Blue king crab have been taken primarily as incidental species while fishing for red king or tanner crab. In response to more restricted and subsequent closures of red king crab fishing seasons, opportunities to harvest blue king crab in certain locations have been provided beginning with the 1983/84 fishing season. Blue king crab fisheries have occurred in conjunction with the brown king and Tanner crab fisheries, which normally begin on February 15.

Sex and Size Limits

From the inception this fishery has been restricted to harvesting only male crab in order to protect the reproductively important female crab. From 1961 through 1968 a minimum legal size of 6 1/2 inches in carapace width existed. Before the 1969/70 season, the minimum legal carapace width was increased to 7 inches in response to Gulf of Alaska growth and size at maturity information. This regulation was implemented to provide additional reproductive protection to the male portion of the stock.

Regulations also provide for the implementation of a minimum legal carapace width of 8 inches, which can be set by emergency order, based on criteria related to the structure of the stock. However, this has not been utilized in Southeast Alaska. In 1978 the size limit for blue king crab was reduced to 6 1/2 inches in response to information from other locations in the state which indicated that growth and size at maturity were smaller for this species.

In 1990 a new regulation provided that any blue king crab infected with the parasitic barnacle, *Briarosaccus callosus*, could be retained and sold regardless of the sex or size of the crab. This regulation is intended to reduce the number of infected crab on the fishing grounds. Infected crab are incapable of reproduction and experience reduced growth. Removing infected crab may improve stock reproduction, growth, and increase maximum size.

Quotas and Guideline Harvest Ranges

In 1970 a quota of 1.5 million lbs was provided for king crab, all species combined. In 1971 separate red and blue, and brown king crab fisheries were recognized with the adoption of distinct seasons and quotas. From 1971 through the 1978/79 season the red and blue king crab quotas or guideline harvest levels were based upon historic harvest and, to a lesser degree, limited size distribution information. The first red and blue king crab quota was set in 1971 at 400,000 lbs per season. This was increased to 600,000 lbs in 1974, then reduced to 400,000 lbs in 1977.

After 1977 quotas were replaced by guideline harvest levels which provide more flexibility in management. The first guideline harvest level of 200,000 to 400,000 lbs was established in 1978. Based upon industry recommendations, this was increased to 300,000 to 600,000 lbs in 1979 and persists today. Since the 1980/81 season, seasonal harvests have been based upon results of a red king crab stock index abundance survey within the regulatory guideline harvest levels. Current regulations specify that a minimum of 300,000 lbs of crab must be available to initiate a fishery.

Fishing Gear

From 1961 through 1967 there was no limit on the amount of gear that could be fished by a vessel participating in the fishery, and no general specifications were associated with the gear fished. In 1968 a limit of 40 pots per vessel was established for Southeast Alaska waters. The maximum number of pots per vessel has increased to 60 in 1974, and to 100 pots per vessel in 1978. The 1988 Alaska Board of Fisheries specified that when a minimal harvest of 300,000 to 400,000 lbs of crab is appropriate, based upon survey results, the pot limit shall be 40 pots per vessel. When a harvest in excess of 400,000 lbs is appropriate, the pot limit shall be 100 pots per vessel.

Prior to the 1969/70 season, pot storage in the water was allowed. Regulations do not provide for a minimum mesh size or other biological directed gear specifications, except that a pot destruct mechanism is required in case the pot is lost. Each pot must be independently buoyed and comply with marking requirements.

Limited Entry

Effective January 1, 1984 a limited entry program was established for the king and Tanner crab pot fisheries in Southeast Alaska by the Alaska Commercial Fisheries Entry Commission, with maximum effort levels of 61 permits established in the red and blue king crab fishery. The number of permits available for this fishery currently stands at 112. Some of these permits are still eligible to fish until the adjudication process has been completed. Prior to the 1990/91 fishing seasons, ring nets were eliminated as legal gear for king crab.

Yakutat Area

Regulation development in the Yakutat Area generally paralleled that in the remainder of the region. The need for specific regulations has not yet occurred in the Yakutat Area. A limited entry system has not been requested or implemented for the Yakutat Area king crab fishery.

1991/92 SEASON SYNOPSIS

Southeast Alaska Red King Crab Fishery

The red king crab fishery in Southeast Alaska was scheduled to open by regulation on November 1, 1991. A projected harvest of at least 300,000 lbs was not available (Table 10) and the fishery did not open. This represents the seventh consecutive season closure of the Southeast Alaska commercial red king crab fishery. The decision to maintain the closure was based upon information collected during the red king crab stock index of abundance survey conducted during the 1991 field season. This information indicated some improvement had occurred in general stock status. However, the improvement in the availability of legal male crab was insufficient to justify an opening.

Southeast Alaska Red King Crab Survey Results

A red king crab index of abundance survey has been conducted in Southeast Alaska since 1979. The survey is not designed to provide an estimate of the total red king crab population. Instead, it provides an index of crab abundance based on the catch of crab per pot. Data from the most current year is compared to previous years to determine if the stock is stable, increasing, or decreasing in relative abundance. This population index is referred to as an index catch-per-unit-effort (CPUE) value.

A review of the historical survey results is presented in Tables 5 through 10. Major fishing districts are 10 through 14 (Table 3). The overall abundance of legal crab in many surveyed bays (Pybus, Gambier, Eagle River, St. James, Lynn Sisters, Excursion Inlet, and Port Frederick) was highest during the 1979 through 1981 surveys (Table 9a). Other important bays (Barlow Cove, Seymour Canal, and Deadmans Reach) peaked during 1983, 1985, and 1987, respectively. A similar trend was true of prerecruit males (Table 9b) and adult females (Table 9c). Generally, it appears that the proportion of prerecruit 3's and 2's are improving (Table 8), indicating that an expected improvement in the legal segment could begin as early as 1993 or 1994. The index CPUE values for all segments of the stock in most surveyed bays declined from 1979 through 1985, and have been relatively low since that time. Exceptions are recent improvements in both Barlow Cove and Deadmans Reach. The 1991 data were utilized to determine if a legal stock above the 300,000 pound threshold was present for the 1991/92 fishing season.

Based upon the method accepted by the Alaska Board of Fisheries at the 1988 meeting, an estimate of the potential available harvest was developed, on a district basis, for surveyed and unsurveyed areas (Table

10). For districts where no surveys are conducted, the average harvest for the 1979/80 through 1984/85 seasons were used. For districts where surveys were completed, the potential harvest was estimated by multiplying the average harvest in the respective district by a percentage of the recent index CPUE value compared to an average index CPUE value for that district. The percentage is obtained by dividing the most recent index CPUE value by the historical average index CPUE value for that district, and multiplying the result by 100 (Table 10). For example, if the recent index CPUE value was 10 legal crab per pot, and the average index CPUE value was 20 legal crab per pot, the resulting percentage is 50% of the average index CPUE value. If the average harvest was 100,000 lbs, then the potential harvest from that district would be 50,000 lbs.

Recent survey index CPUE values for the legal portion of the population were below the historic average index CPUE values in all bays except Seymour Canal, Barlow Cove, and Deadmans Reach. The potential harvest from the major districts was projected to be below average harvest levels. When the current index CPUE values were considered with the average harvest levels, the potential 1991/92 seasonal harvest for Southeast Alaska was estimated to be approximately 274,000 lbs of legal crab (Table 10).

The current regulations mandate that a minimum threshold harvest level of 300,000 lbs of legal male red king crab be available before an open commercial season is allowed. With only 274,000 lbs available, under average stock conditions, the fishery remained closed. However, it is important to note that improvements occurred in the index CPUE values for portions of the stock in at least three bay areas.

Southeast Alaska Blue King Crab Fishery

The harvest of blue king crab has occurred incidental to the harvest of red king crab or Tanner crab. As the red king crab fishery was closed during the 1991/92 season, blue king crab fishing was allowed during the brown king crab and Tanner crab seasons as provided by regulation, in specified areas where blue king crab stocks are known. The open fishing areas were limited to Taku Inlet, Port Snettisham and Holkam Bay in District 11, Glacier Bay in District 14, and upper Lynn Canal in District 15. The fishery opened on February 15, 1992. Ten vessels made 17 incidental landings of blue king crab for a total of less than 1,800 lbs of crab. This fishery closed on May 8, 1992, when the brown king crab fishery in the Icy Strait, Chatham Strait and Frederick Sound areas were closed. Stock assessment surveys are not conducted for blue king crab.

Yakutat Red and Blue King Crab Fishery

The Yakutat red king crab season was open from November 15, 1991 through January 24, 1992. This opening represented the entire period possible by regulations. A very small harvest of red and blue king crab occurred in the Yakutat Area this past season. However, due to the number of vessels involved, the actual harvest remains confidential. Stock assessment surveys are not conducted in the Yakutat area.

1992/93 SEASON OUTLOOK

Southeast Alaska Red King Crab Fishery

The abundance of Southeast Alaska red king crab populations has decreased in most bay areas from peaks that occurred earlier in the history of the fishery. It is not possible to determine the cause and effect relationships that have influenced these stocks, however, statements can be made based upon survey results and dockside sampling data.

Survey Results

First, the 1991 survey did indicate considerable optimism for a future harvest from some bays as the number of legals appears to be increasing (Table 9a), the number of prerecruit male crab (particularly prerecruit "threes" and "twos"), appears to be increasing (Tables 8 and 9b), and the number of adult females appears to be increasing (Table 9c). Since survey methods changed in 1986, results from the 1991 survey may not be directly comparable to those from the 1979 through 1985 surveys.

Second, it is possible that either age at recruitment is considerably older than the 4 to 6 years previously thought, larval and juvenile survival between 1979 and 1982 was very low, some combination of the two, or other factors. This is evidenced by the lack of legal crab at the present time, even though adult female abundance was relatively high prior to 1982 (Table 9c). Information provided at the November 1989 International Symposium on King and Tanner Crab suggests that the age at recruitment for red king crab may be approximately 8 years, under normal growth conditions. Additionally, the maximum age of red king crab held in captivity in Japan is 21 years. Therefore, this species may have a longer maximum age than previously thought. When both of these factors are considered, annual fishing mortalities used in past

fisheries may have been too exploitative and could have contributed to a reduction in stock conditions.

Third, survival and growth is variable between areas. Depending upon the location considered, growth of mature male red king crab in Southeast Alaska ranges from 13.6 to 19.8 mm per molt. Conditions may not exist that allow high population levels in all fishing areas at the same time.

Fourth, it is becoming apparent that recruitment events are variable with respect to time, abundance and location. This is evidenced by the lack of prerecruit and recruit crab during the previous 5 to 7 years (Table 5). When a recruitment event occurs it may be the only significant recruitment available to support the fishery for a good number of seasons. If continued fishing over time is an objective of management, then when recruitment events are identified, they must be nurtured through conservative management, or until another significant recruitment event is evident.

Dockside Sampling Data

Size frequency and shell condition data collected from the landed catch also indicate that recruitment events are variable. The percent contribution of recruit crab to the total catch has varied between 26.0 and 60.1 percent for data collected beginning with the 1970/71 fishing season (Table 4a). Dependency upon the recruit fraction was not consistent during the 1970/71 through the 1978/79 seasons. Recent data, beginning with the 1979/80 season, have been highly dependent upon the recruit fraction of the harvest for the successful prosecution of the fishery.

During the 1970/71 through the 1978/79 seasons the contribution of the postrecruit portion of the stock was often very significant as indicated by postrecruit ones that exceeded 40 percent of the harvest during four of nine fishing seasons (Table 4a). In only three of nine fishing seasons did the number of postrecruit twos fall below 12 percent (Table 4a). This situation indicates that a portion of recruits were not exploited during early fisheries and these crab remained in the stock to increase in size and age, and to significantly contribute to the fishery as larger postrecruit crab during subsequent fishing seasons.

There is a clear contrast with similar data collected during the last six seasons when fishing occurred. During the last six seasons the contribution of postrecruit ones did not rise above 40 percent. Additionally, the contribution of postrecruit twos only exceeded 12 percent during three of six fishing seasons. This indicates that recent harvests removed a large portion of the recruits and the postrecruit ones, and were not successful in allowing the escapement of significant numbers of crab that could increase in size and age to add stability to the harvests during future seasons when recruitment was declining.

Summary

In summary, red king crab stock conditions remain relatively low, but may be realizing significant improvement. This improvement may be limited to a relatively small number of bay areas. Continued surveys are necessary to monitor the situation closely in order to implement correct management. Lastly, when stocks have adequately improved they must be managed more conservatively than during recent fisheries to ensure that stock health is maintained at sufficient levels. The survey scheduled during the June and July, 1993 period will determine stock health and guide management decisions for the 1993/94 fishing season.

Southeast Alaska Blue King Crab Fishery

Blue king crab fishing opportunities during the 1992/93 season in portions of Districts 11, 14, and 15 will occur during the open brown king crab and Tanner crab fisheries. Fishing opportunities for blue king crab during the past six seasons have not identified stocks of sufficient size to warrant a directed fishery on this species. Since the 1976/77 season an average of less than 7,500 lbs per season have been landed. Exploratory fishing opportunities for two years did not identify any significant populations of blue king crab. It is anticipated that future harvests will be similar to that experienced last season.

Yakutat Red and Blue King Crab Fishery

Fishing opportunities are provided by regulation, but past fishing efforts have been small, with resulting small harvests. It is anticipated that the same situation will exist next season.

Table 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvest, number of landings and number of vessels by year or season, 1960 to present.

Year/ Season ^u	Total Catch ^w	Number of ^c Landings	Number of ^d Permits
1960	3,424		
1961	429,600		3
1962	1,289,550		8
1963	1,112,200		8
1964	820,530		9
1965	579,300		7
1966	105,899		8
1967	599,078		7
1968	2,199,722		19
1969	1,899,930	122	39
1969/70	1,438,226	401	33
1970/71	221,369	151	20
1971/72	391,623	213	18
1972/73	476,761	161	17
1973/74	640,369	207	27
1974/75	537,189	201	28
1975/76	346,341	170	25
1976/77	334,672	171	36
1977/78	285,057	144	35
1978/79	452,064	168	35
1979/80	670,859	251	43
1980/81	528,502	199	38
1981/82	537,712	180	48
1982/83	456,907	165	72
1983/84	320,259	139	103
1984/85	276,710	136	98
1985/86 ^v	2,394	19	16
1986/87 ^u	1,179	15	13
1987/88 ^u	1,519	36	19
1988/89 ^w	8,130	24	13
1989/90 ^u	24,881	35	14
1990/91 ^u	1,210	16	10
1991/92 ^w	1,734	17	10

^u Data for years 1960 through 1969/70 season are from management reports and informal fish ticket logs.

^w 1960 through 1969 data is for all three species of king crab combined (red, brown, and blue king crab).

^c Total landings are the number of unique fish tickets reporting king crab landings in any combination in a season.

^d Total permits are the number of unique CFEC numbers that made landings in a season.

^u Red king crab season closed in Southeast Alaska, blue king crab open February 10-24, 1986.

^u Red king crab season closed in Southeast Alaska, blue king crab open January 15-29, 1987.

^u Traditional red king crab season closed in Southeast Alaska; experimental red king crab opened July 1, 1988; blue king crab open January 15-February 16, 1988.

^w Traditional red king crab season closed in Southeast Alaska; experimental red king crab closed January 29, 1989; blue king crab opened February 15, 1989 and closed March 8, 1989.

^v Traditional red king crab season closed in Southeast Alaska; experimental red king crab closed January 31, 1990, and blue king crab in the Icy Strait/Lynn Canal area closed January 29, 1990. Blue king crab opened again February 15, 1990. The Frederick Sound areas for blues closed April 4, 1990, and Icy Strait/Lynn Canal blues closed November 9, 1990.

^y Traditional red king crab season closed in Southeast Alaska. Blue king crab opened February 15, 1991 and closed June 20th.

^w Traditional red king crab season closed in Southeast Alaska. Blue king crab opened February 15, 1992 and closed on May 8, 1992. Most recent year's data should be considered preliminary.

Table 2. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvests in thousands of pounds by month and season, 1972/73 to present.

Season	Month												Total Landings	Total Permits
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.		
1972/73	83.9	117.4	136.2	116.7	22.4	Closed							161	17
1973/74	171.8	228.1	184.0	50.1	6.2	0.1							207	27
1974/75	68.9	117.0	125.4	132.9	92.6	0.3							201	28
1975/76	45.4	111.7	68.6	57.0	59.5	4.1							170	25
1976/77	32.9	94.1	57.4	69.7	67.7	6.9							171	36
1977/78	38.9	43.9	45.3	50.9	57.2	5.7							144	35
1978/79	82.0	105.2	99.2	110.1	55.7	Closed							168	35
1979/80	209.4	182.5	174.3	104.7	Closed	Closed							251	43
1980/81	209.3	155.0	78.1	86.1	Closed	Closed							199	38
1981/82	Closed	327.8	176.3	33.4	Closed	Closed							180	48
1982/83	Closed	420.7	20.3	15.7	0.3	Closed							165	72
1983/84	Closed	Closed	292.9	18.8	7.9	Closed							139	103
1984/85	Closed	268.7	7.0	Closed	Closed	Closed							136	98
1985/86 ^u	Closed	Closed	Closed	Closed	*	1.9							19	16
1986/87 ^w	Closed	Closed	Closed	Closed	0.9	0.3							15	13
1987/88 ^v	Closed	Closed	Closed	Closed	0.4	1.2							36	19
1988/89 ^u	0.0	*	*	*	*	0.2	*	*	*	*	0.0	0.0	24	13
1989/90 ^u	*	*	*	*	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	35	14
1990/91 ^u	0.0	0.0	0.0	*	*	0.5	*	0.0	0.0	0.0	0.0	0.0	16	10
1991/92 ^u	0.0	0.0	0.0	0.0	*	*	0.7	*	0.0	0.0	0.0	0.0	17	10

^u Red king crab season closed in Southeast Alaska; blue king crab open February 10-24, 1986.

^w Red king crab season closed in Southeast Alaska; blue king crab open January 15-29, 1987.

^v Traditional red king crab season closed in Southeast Alaska; experimental red king crab opened July 1, 1988, in Southeast Alaska; blue king crab open January 15-February 16, 1988.

^u Traditional red king crab season closed in Southeast Alaska; experimental red king crab open through January 29, 1989; blue king crab opened February 15, 1989, and closed March 8, 1989, with Tanner crab in Frederick Sound.

^u Traditional red king crab season closed in Southeast Alaska; experimental red king crab open through noon, January 31, 1990; blues closed in the Icy Strait area on January 29, 1990. Traditional blue king crab opened on February 15 and closed with browns in Frederick Sound on April 4, 1990.

^u Traditional red king season closed in Southeast Alaska; experimental red king crab fishery repealed by the Board of Fisheries; blue king crab closed with browns on November 9, 1990, in the Icy Strait area. The traditional blue king crab fishery opened February 15, 1991; Frederick Sound and Icy Strait blue king crab closed on June 20, 1991.

^u Traditional red king crab season closed in Southeast Alaska. Blue king crab opened February 15, 1992 and closed on May 8, 1992. Most recent year's data should be considered preliminary.

* Where number of vessels participating is three or less, the information is considered confidential.

Table 3. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvests in thousands of pounds by district and season, 1970/71 to present.

District	1970/ 1971	1971/ 1972	1972/ 1973	1973/ 1974	1974/ 1975	1975/ 1976	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	1980/ 1981	1981/ 1982	1982/ 1983	1983/ 1984	1984/ 1985
1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	*	0.0	*	*	0.0	0.0	*	*
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.1	0.0	0.0	*	*	0.0	*	0.0	*	7.3	*	0.0
6	0.0	0.0	2.1	0.8	1.5	0.0	*	*	0.0	*	*	*	0.0	*	0.0
7	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	*	*	*	*	*	0.0
8	3.2	7.0	16.8	4.3	7.6	0.0	15.6	*	*	*	27.6	*	*	0.0	*
9	45.2	21.7	11.2	21.2	30.2	0.0	17.5	0.0	0.0	*	*	*	*	*	*
10	118.3	231.4	183.0	273.4	124.5	0.0	49.3	43.0	118.5	168.4	163.7	114.4	77.5	79.5	58.7
11	130.8	164.4	109.1	114.3	74.1	0.0	82.0	64.4	122.6	220.2	179.8	135.9	63.7	37.1	89.9
12	48.6	57.8	19.0	25.1	64.6	53.4	*	*	14.1	39.5	*	32.7	98.0	31.4	14.0
13	1.1	95.4	34.5	78.4	102.2	97.5	*	*	112.5	79.4	73.1	117.6	70.8	46.7	51.9
14	0.8	46.2	95.4	87.9	117.0	103.7	65.4	22.2	43.1	89.1	*	34.6	99.4	81.4	49.7
15	53.8	17.5	0.0	34.6	8.5	6.7	24.7	*	29.7	12.2	41.4	53.8	30.7	6.5	9.9
16	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yakutat	0.0	0.0	4.5	0.0	6.6	0.0	0.0	*	*	12.5	*	*	4.1	1.2	0.0
Total	221.4	372.9	476.8	640.4	537.2	346.4	328.7	242.0	452.1	670.9	528.5	537.7	456.9	320.3	276.7

-Continued-

Table 3.

(Page 2 of 2.)

District	1985/ 1986 ^u	1986/ 1987 ^u	1987/ 1988 ^d	1988/ 1989 ^d	1989/ 1990 ^d	1990/ 1991 ^u	1991/ 1992 ^u
1	0.0	0.0	0.0	0.0	*	-	-
2	0.0	0.0	0.0	0.0	0.0	-	-
3	0.0	0.0	0.0	*	*	-	-
4	0.0	0.0	0.0	*	0.0	-	-
5	0.0	0.0	*	*	*	-	-
6	0.0	0.0	0.0	0.0	0.0	-	-
7	0.0	0.0	0.0	0.0	0.0	-	-
8	0.0	0.0	0.0	*	0.0	-	-
9	0.0	0.0	0.0	0.0	*	-	-
10	*	0.0	*	*	*	*	-
11	1.4	0.4	0.6	2.3	0.8	0.2	1.0
12	0.0	*	*	0.0	0.0	-	-
13	0.0	0.0	0.0	0.0	0.0	-	-
14	*	*	0.7	*	1.7	*	*
15	0.3	0.3	*	0.0	3.5	*	*
16	0.0	0.0	0.0	0.0	0.0	-	*
Yakutat	0.0	0.0	0.0	0.0	0.0	*	*
Total	2.4	1.2	1.5	8.1	24.9 ^u	1.2	1.7

^u Red king crab season closed in Southeast Alaska; blue king crab open February 10-24, 1986.

^u Red king crab season closed in Southeast Alaska; blue king crab open January 15-February 29, 1987.

^d Red king crab season closed in Southeast Alaska; experimental red king crab opened July 1, 1988, in Southeast Alaska; blue king crab open January 15-February 16, 1988.

^u Traditional red king crab season closed; experimental red king crab fishery was open through January 29, 1989; blue king crab opened February 15, 1989 and closed March 8, 1989, with Tanner crab in Frederick Sound.

^u Traditional red king crab season closed in Southeast Alaska; experimental red king crab open through January 31, 1990, and blue king crab in the Icy Straits/Lynn Canal area closed January 29, 1990. Traditional blue king crab opened February 15 and closed with browns in Frederick Sound on April 4, 1990.

^u Traditional red king season closed in Southeast Alaska; experimental red king crab fishery repealed by the Board of Fisheries; blue king crab closed with browns on November 9, 1990, in the Icy Straits area. The Traditional blue king crab fishery opened February 15, 1991 and closed June 20, 1991 in Frederick Sound and Icy Straits areas.

^u Most recent year's data should be considered preliminary.

^u Majority of this harvest is from illegal catch and test fishing.

* Where number of vessels participating is three or less, the information is considered confidential.

Table 4a. Southeast Alaska (Statistical Area A) summary of commercial red king crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.^{1/}

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruitment					
			Average	Range	Recruits ^{2/}	% PR +1 ^{3/}	% PR +2 ^{4/}	% PR +3 ^{5/}	% PR +4 ^{6/}	% Skip Molts ^{7/}
1970/71	28	3,333	164.8	138-214	31.4	43.9	20.7	3.6	0.5	23.3
1971/72	9	838	161.1	134-203	44.6	34.1	16.1	4.9	0.3	24.9
1972/73	29	2,914	158.6	133-205	53.9	31.9	11.5	2.4	0.1	19.9
1973/74	15	1,438	161.6	140-208	27.6	52.5	17.6	2.1	0.2	38.6
1974/75	19	2,275	166.4	137-200	26.0	46.6	22.4	4.9	0.0	22.2
1975/76	23	2,058	160.3	135-207	48.8	29.3	17.0	4.7	0.2	20.8
1976/77	18	1,460	160.6	115-204	50.0	33.1	11.8	4.5	0.6	20.3
1977/78	33	3,277	156.7	136-203	28.4	44.7	18.2	8.5	0.2	59.3
1978/79	17	1,603	155.4	137-202	60.1	30.4	8.5	0.9	0.1	21.4
1979/80	30	3,081	156.1	137-193	52.8	34.3	11.0	1.8	0.0	27.6
1980/81	48	4,101	156.3	134-196	51.5	36.6	10.5	1.4	0.0	27.7
1981/82	34	3,316	158.8	123-199	46.3	35.8	15.3	2.5	0.0	29.9
1982/83	30	2,821	159.4	137-200	44.8	35.4	15.1	4.7	0.0	29.2
1983/84	34	3,414	158.5	137-196	51.1	34.8	11.5	2.6	0.0	24.0
1984/85	36	3,641	159.6	139-196	48.0	38.4	12.2	1.5	0.0	22.0
1985/86			Fishery Closed							
1986/87			Fishery Closed							
1987/88			Fishery Closed							
1988/89			Fishery Closed							
1989/90			Fishery Closed							
1990/91			Fishery Closed							
1991/92			Fishery Closed							

^{1/} Dockside sampling not conducted in Statistical Area D (Yakutat)

^{2/} Recruits = all new and soft shell crab ≥145 mm and ≤161 mm carapace length.

^{3/} PR + 1 = all new and soft shell crab ≥162 mm and ≤178 mm, and old and very old shell crab ≥145 mm and ≤161 mm, carapace length.

^{4/} PR + 2 = all new and soft shell crab ≥179 mm and ≤195 mm, and ≥162 mm and ≤178 mm, and very old ≥145 mm and ≤161 mm, carapace length.

^{5/} PR + 3 = all new and soft shell crab ≥196 mm and all old ≥179 mm and ≤195 mm, and very old ≥162 mm and ≤178 mm, carapace length.

^{6/} PR + 4 = all old and very old where carapace length ≥196 mm.

^{7/} Skip molts = all old and very old crab.

Table 4b. Southeast Alaska (Statistical Area A) summary of commercial red king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.^{1/}

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested	Percent of Harvest Sampled
						Average	Range		
1970/71									
1971/72									
1972/73									
1973/74									
1974/75									
1975/76	2					8.36	7.49-9.22	11,345	20.0
1976/77	4					8.54	7.34-10.1	38,303	5.4
1977/78	13					7.41	6.85-8.38	36,875	4.0
1978/79	6					7.11	6.29-8.67	80,773	2.0
1979/80	4					7.25	6.62-7.94	90,722	3.4
1980/81	41	5,920	31,187	6.18	1.0-14.47	7.19	6.38-8.16	42,826	9.6
1981/82	17	600	900	1.50	1.50-1.50	7.23	6.45-8.73	72,491	4.6
1982/83	22	1,542	6,449	3.22	1.30-7.63	7.54	6.61-8.51	54,600	5.2
1983/84	18	3,193	3,640	1.54	0.16-4.33	7.26	6.37-8.73	38,661	8.8
1984/85	16	1,804	4,507	3.24	1.27-6.30	7.56	6.49-9.30	35,884	10.1
1985/86			Fishery Closed						
1986/87			Fishery Closed						
1987/88			Fishery Closed						
1988/89			Fishery Closed						
1989/90			Fishery Closed						
1990/91			Fishery Closed						
1991/92			Fishery Closed						

^{1/} Dockside sampling not conducted in Statistical Area D (Yakutat)

Table 5. Statistical Area A (Southeast Alaska) comparison of standardized index data and commercial sampling data of male red king crab, 1979 to present. Numbers of crab are calculated as the number of pots per stratum in each bay times the standardized catch per pot in each stratum, summed across strata and bays.

Year	Sample Size	Number of Pot Lifts	Number of Sublegals	Standardized Index Data			Proportion of Recruits in Legal Pop.	Proportion of Postrecruits In Legal Pop.
				Number of Legals ^u	Number of Recruits	Number of Postrecruits		
1979	4,288	320	3,154	1,134	707	426	0.6235	0.3765
1980	3,217	295	2,388	829	519	311	0.6261	0.3739
1981	4,475	371	3,477	998	670	328	0.6713	0.3287
1982	2,386	414	1,435	951	576	374	0.6057	0.3943
1983	2,439	389	1,611	828	474	354	0.5725	0.4275
1984	2,090	378	1,174	917	490	427	0.5344	0.4656
1985	1,490	385	963	528	267	261	0.5057	0.4943
1986	2,345	469	1,655	689	322	367	0.4673	0.5327
1987 ^u								
Summer	1,110	197	846	264	171	93	0.6477	0.3523
Fall	847	157	686	161	83	78	0.5155	0.4845
1988 ^d								
Summer	1,449	272	1,227	222	130	92	0.5856	0.4144
Fall	1,881	352	1,572	308	181	127	0.5877	0.4123
1989 ^u	1,955	180	1,849	106	79	28	0.7383	0.2617
1991	2,990	387	2,428	562	460	102	0.8185	0.1815
Average							0.6072	0.3928

-Continued-

Table 5. (Page 2 of 2)

Season	Sample Size	Commercial Dockside Sampling Data		Number of Legal Recruits	Number of Legal Postrecruits	Proportion of Recruits In Legal Pop.	Proportion of Postrecruits In Legal Pop.
		Number Less than 145 mm	Number Greater than 145 mm				
1979/80	3,495	170	3,325	2,032	1,282	0.6111	0.3889
1980/81	4,235	254	3,981	2,368	1,613	0.5948	0.4052
1981/82	3,413	117	3,296	1,670	1,626	0.5067	0.4933
1982/83	2,808	104	2,704	1,358	1,346	0.5022	0.4978
1983/84	3,566	154	3,412	1,956	1,456	0.5733	0.4267
1984/85	2,238	67	2,171	980	1,191	0.4514	0.5486
1985/86	Red King Crab Season Closed						
1986/87	Red King Crab Season Closed						
1987/88	Red King Crab Season Closed						
1988/89	Red King Crab Season Closed						
1989/90	Red King Crab Season Closed						
1990/91	Red King Crab Season Closed						
1991/92	Red King Crab Season Closed						
Average						0.5399	0.4601

^N Legal crab are defined here as all recruits and post recruits ≥ 145 mm carapace length.

^W In 1987, partial surveys were conducted during summer in four bays and during fall in two bays. These statistics cannot be directly compared to the full summer surveys of 1979-1986.

^C Only a partial survey of six bays occurred in summer 1988 and a full survey of ten bays occurred in fall 1988.

^d Only a partial survey of four bays occurred in the fall of 1989.

Table 6. Statistical Area A (Southeast Alaska) comparison of historic red king crab index of abundance survey data, 1979 through 1985.^{a/}

	1979	1980	1981	1982	1983	1984	1985
Number of Pot Lifts	320	295	371	414	390	378	385
Red King Crab							
No. females captured	5,140	2,611	5,009	4,079	2,933	2,325	2,079
No. males captured	4,288	3,217	4,475	2,386	2,439	2,090	1,490
No. legals captured	1,134	829	998	951	828	917	528
No. sublegals captured	3,154	2,388	3,477	1,435	1,611	1,174	963
Tanner Crab							
No. females captured	902	732	977	2,026	1,322	683	1,278
No. males captured	1,628	3,309	5,771	4,819	3,695	2,464	4,834
No. legals captured	803	1,766	3,573	2,435	1,897	995	1,992
No. sublegals captured	825	1,543	2,198	2,384	1,798	1,468	2,842
Halibut ^{b/}							
No. captured	204	369	574	848	623	779	802
No. legals captured	86	163	248	320	203	316	285
Avg. length (cm)	78.2	79.1	79.1	77.4	75.7	77.8	78.3
Avg. weight (kg) ^{c/}	5.8	5.8	5.8	5.2	5.2	5.2	5.8
Pacific Cod ^{b/}							
No. captured	79	166	246	537	287	449	390
Avg. length (cm)	71.8	67.8	64.9	65.0	62.4	64.7	64.2
Avg. weight (kg) ^{d/}	4.5	3.7	3.3	3.3	2.9	3.2	3.2

^{a/} Crab data is standardized to 24 hour soak. The 1979 through 1985 surveys were conducted using fixed station locations with four pots per station.

^{b/} Halibut and pacific cod catches are unstandardized.

^{c/} Utilized IPHC table to convert length in cm to round weight in kg.

^{d/} Utilized $\log_{10} W = 3.1 \log_{10} L - 2.103462$ from Ketchen, 1967 FRBC Tech. Report No. 23.

Table 7. Statistical Area A (Southeast Alaska) comparison of historic red king crab index of abundance survey data, 1986 through 1991^{a/}.

	1986	1987 ^{a/}	1987 ^{a/}	1988 ^{a/}	1988 ^{a/}	1989 ^{a/}	1991 ^{b/}
Number of Pot Lifts	469	197	157	272	352	180	387
Red King Crab							
No. females captured	2,396	1,647	740	1,255	1,903	2,024	4,554
No. males captured	2,345	1,110	847	1,449	1,881	1,955	2,990
No. legal males captured	689	264	161	223	309	106	562
No. sublegal males captured	1,656	846	686	1,227	1,572	1,849	2,428
Tanner Crab							
No. females captured	1,967	992	468	1,234	1,336	676	2,441
No. males captured	5,128	2,862	1,330	3,741	4,548	1,458	4,550
No. legal males captured	2,000	1,365	531	1,867	2,629	746	2,015
No. sublegal males captured	3,128	1,497	799	1,874	1,919	712	2,535
Halibut ^{d/}							
No. captured	785	307	158	332	305	40	268
No. legals captured	323	101	44	125	106	21	155
Avg. length (cm)	82.6	78.4	75.6	78.1	75.0	88.1	87.9
Avg. weight (kg) ^{b/}	6.8	5.5	5.1	5.7	5.0	10.1	8.3
Pacific Cod ^{d/}							
No. captured	390	225	326	235	395	186	393
Avg. length (cm)	62.7	62.1	58.4	61.8	60.1	56.4	61.6
Avg. weight (kg) ^{d/}	2.9	2.9	2.4	2.8	2.6	2.1	2.8

^{a/} Crab data is standardized to 24 hour soak. The 1986 through 1991 surveys were conducted using a stratified random sampling design where bays are divided into strata based on areas of high, medium, and low densities.

^{b/} Utilized IPHC table to convert length in cm to round weight in kg.

^{c/} Utilized log10 W=3.1 log10 L-2.103462 from Ketchen, 1967 FRBC Tech. Report No. 23.

^{d/} Halibut and pacific cod catches are unstandardized.

^{e/} Partial surveys were conducted in July and October of 1987.

^{f/} Partial survey in June and July of 1988 in six bays; full survey of ten bays in September and October 1988.

^{g/} Partial survey in September and October of 1989 in four bays.

^{h/} Full survey of ten bays in June and July 1991.

Table 8. Statistical Area A (Southeast Alaska) summary of standardized male red king crab index data in percent by size/age class, 1979 through 1991.

Year	Sample Size	Prerecruits				Recruits	Post-Recruits
		Fours	Threes	Twos	Ones		
1979	4,288	7.42	19.23	27.40	23.27	16.01	6.7
1980	3,217	7.19	12.19	20.40	30.46	19.66	10.1
1981	4,475	6.31	17.14	24.71	27.93	16.14	7.8
1982	2,386	3.41	10.53	19.63	27.60	19.49	19.4
1983	2,439	6.08	12.64	29.23	26.22	17.14	8.7
1984	2,090	3.46	9.93	16.58	32.98	22.16	14.9
1985	1,490	7.86	16.19	19.76	28.57	15.24	12.4
1986 ^{a/}	2,345	24.50	23.07	18.62	15.18	8.98	9.7
1987 ^{b/}							
Summer	1,110	8.19	20.97	24.74	20.76	15.87	9.5
Fall	847	26.17	22.00	20.05	15.48	9.24	7.1
1988 ^{c/}							
Summer	1,449	25.0	25.33	21.89	12.47	8.96	6.39
Fall	1,881	39.25	19.87	14.86	9.82	9.40	6.80
1989 ^{d/}	1,955	25.10	39.03	22.15	8.21	4.03	1.42
1991	2,990	13.62	24.23	24.75	18.18	15.71	3.51

^{a/} The survey design was changed in 1986 and new areas added.

^{b/} These statistics are not directly comparable to 1979-1985 data because only partial surveys were conducted. Four bays were surveyed in the summer and two in the autumn.

^{c/} These statistics are not directly comparable to 1979-1985 data because only partial survey of six bays occurred in summer of 1988 and a full survey of ten bays occurred in fall of 1988.

^{d/} These statistics are not directly comparable to 1979-1985 data because only a partial survey of four bays occurred in fall of 1989.

Table 9a.

Stratified mean index survey CPUE values of legal (recruit plus postrecruits) male red king crab by bay and survey for the years 1979 through summer 1991. Data standardized for a 24-hour soak.

Location	1979	1980	1981	1982	1983	1984	1985	1986 ^a	Sum. 1987	Fall 1987	Sum. 1988	Fall 1988	1989	1991	Average Index Survey CPUE Value By Bay ^b	Standard Deviation
Farragut Bay	7.73	0.65	0.10	0.26	0.03	0.57	1.09	0.25	-	-	-	-	-	-	1.34	2.44
Pybus Bay	4.87	4.03	3.19	4.03	4.09	1.85	0.65	0.16	0.19	0.41	-	0.01	-	0.38	1.99	1.82
Gambier Bay	4.43	11.28	7.45	3.44	2.34	0.52	0.88	1.83	-	-	0.74	0.88	0.24	2.73	3.06	3.17
Seymour Canal	2.10	1.55	2.13	1.09	1.61	2.89	4.90	1.48	-	-	1.10	3.16	0.17	2.44	2.05	1.17
Young Bay	0.72	0.03	0.82	0.08	0.16	0.86	0.23	-	-	-	-	-	-	-	0.41	0.34
Barlow Cove	7.37	14.65	4.68	0.50	8.12	4.69	1.16	1.97	0.86	2.48	0.43	1.47	2.84	1.65	3.78	3.82
Eagle River	0.89	1.63	5.27	0.77	0.95	3.37	0.75	0.69	0.11	-	-	0.09	-	0.87	1.40	1.49
St. James Bay	3.62	3.90	3.60	2.17	1.00	1.01	1.13	1.05	-	-	-	0.95	-	2.53	2.10	1.17
Lynn Sisters	7.72	7.01	8.93	0.44	0.10	0.80	0.16	0.63	-	-	-	0.15	-	1.99	2.79	3.40
Funter Bay	12.12	-	-	9.15	4.40	4.15	9.49	4.82	-	-	-	-	-	-	7.36	3.05
Hawk Inlet	2.04	-	-	18.00	16.97	21.29	5.75	4.94	-	-	-	-	-	-	11.50	7.46
Excursion Inlet	3.00	1.72	1.63	0.95	0.43	1.72	0.31	0.83	0.24	-	1.04	0.04	-	0.38	1.02	0.82
Port Frederick	3.66	2.61	1.63	0.95	1.49	3.16	1.22	0.97	-	-	0.63	0.10	-	0.34	1.52	1.10
Iyoukeen Cove	20.01	0.00	0.13	3.70	9.89	4.94	3.13	1.19	-	-	-	-	-	-	5.37	6.29
Freshwater Bay	3.15	0.53	3.46	4.38	1.24	1.09	0.11	-	-	-	-	-	-	-	1.99	1.52
Sitkoh Bay	7.64	-	3.73	7.37	0.18	0.00	-	0.00	-	-	-	-	-	-	3.15	3.34
Rodman Bay	0.03	-	1.04	7.86	4.46	3.46	1.48	0.42	-	-	-	-	-	-	2.68	2.59
Deadman Reach	0.70	0.65	1.40	2.40	2.03	3.61	1.35	2.12	3.06	1.39	0.48	0.20	0.35	2.18	1.57	1.01

^a The survey design was changed in 1986 from a set station pattern to stratified and random pot sets.

^b Average is not a weighted average.

Table 9b. Stratified mean index survey CPUE values of prerecruit male red king crab by bay and survey for the years 1979 through summer 1991. Data standardized for a 24-hour soak.

Location	1979	1980	1981	1982	1983	1984	1985	1986 ^a	Sum. 1987	Fall 1987	Sum. 1988	Fall 1988	1989	1991	Average Index Survey CPUE Value By Bay ^b	Standard Deviation
Farragut Bay	0.19	0.09	0.38	0.58	1.96	0.42	0.65	0.00	-	0.00	-	-	-	-	0.47	0.61
Pybus Bay	9.19	10.05	7.42	2.28	1.11	0.04	0.18	0.00	0.12	-	-	0.00	-	0.42	2.80	3.82
Gambier Bay	12.54	24.45	18.36	4.73	7.69	0.73	0.38	1.08	-	-	3.45	2.89	2.40	4.45	6.93	7.33
Seymour Canal	2.29	6.17	11.56	2.26	4.51	4.50	2.13	0.31	-	-	1.11	3.22	0.73	2.86	3.47	2.93
Young Bay	1.21	0.79	2.19	0.00	0.31	0.14	0.46	-	-	-	-	-	-	-	0.73	0.76
Barlow Cove	19.56	21.58	11.99	1.52	16.01	7.09	9.14	26.76	7.61	25.76	20.63	23.49	40.68	34.27	19.01	10.59
Eagle River	3.80	14.95	37.19	0.78	7.44	7.30	2.71	1.45	0.99	-	-	4.55	-	5.02	7.84	10.05
St. James Bay	9.25	6.65	4.28	0.55	2.51	1.67	3.20	4.67	-	-	-	7.25	-	3.26	4.33	2.56
Lynn Sisters	16.20	12.82	3.38	1.64	0.07	0.55	0.45	0.44	-	-	-	0.22	-	1.41	3.72	5.53
Funter Bay	14.39	-	-	10.93	3.31	4.13	8.20	13.01	-	-	-	-	-	-	9.00	4.60
Hawk Inlet	39.00	-	-	32.60	11.42	17.67	1.69	6.93	-	-	-	-	-	-	18.22	14.74
Excursion Inlet	15.61	7.17	12.00	2.86	1.20	0.64	0.26	0.99	0.55	-	0.79	0.40	-	0.96	3.62	4.96
Port Frederick	8.85	4.38	10.12	3.39	1.25	1.55	3.76	4.26	-	-	1.39	0.22	-	0.33	3.59	3.13
Iyoukeen Cove	10.46	0.00	0.05	5.16	4.47	0.06	0.06	0.01	-	-	-	-	-	-	2.53	3.87
Freshwater Bay	6.24	2.23	5.43	2.59	0.57	0.13	0.00	-	-	-	-	-	-	-	2.46	2.52
Sitkoh Bay	14.18	-	7.15	2.97	0.36	0.00	-	0.00	-	-	-	-	-	-	4.11	5.65
Rodman Bay	-	-	5.92	5.18	1.88	0.26	0.56	0.25	-	-	-	-	-	-	2.34	5.00
Deadman Reach	3.72	1.55	7.13	6.44	7.98	6.71	5.73	4.84	7.93	4.83	4.04	7.66	8.97	12.84	6.46	2.54

^a The survey design was changed in 1986 from a set station pattern to stratified and random pot sets.

^b Average is not a weighted average.

Table 9c. Stratified mean index survey CPUE values of adult female red king crab by bay and survey for the years 1979 through summer 1991. Data standardized for a 24-hour soak.

Location	1979	1980	1981	1982	1983	1984	1985	1986 ^a	Sum. 1987	Fall 1987	Sum. 1988	Fall 1988	1989	1991	Average Index Survey CPUE Value By Bay ^a	Standard Deviation
Farragut Bay	0.62	0.10	0.60	0.21	0.90	0.21	0.29	0.00	-	-	-	-	-	-	0.37	0.31
Pybus Bay	4.46	5.98	11.37	2.06	0.40	0.35	0.20	0.00	0.55	0.30	-	0.35	-	1.09	2.26	3.29
Gambier Bay	8.79	13.10	44.80	2.04	4.84	0.08	0.06	0.91	-	-	0.90	0.88	3.73	2.70	6.90	12.03
Seymour Canal	1.66	6.18	10.73	6.35	6.39	9.05	6.43	1.24	-	-	1.33	3.79	2.06	2.90	4.84	3.02
Young Bay	2.55	1.67	4.70	0.08	0.87	1.30	1.43	-	-	-	-	-	-	-	1.80	1.48
Barlow Cove	95.16	35.83	60.65	15.20	14.37	5.39	8.31	17.19	7.14	9.15	5.34	6.32	14.70	76.94	26.55	28.44
Eagle River	23.12	11.80	9.30	6.52	13.31	7.09	13.14	8.67	2.86	-	-	3.92	-	6.37	9.65	5.38
St. James Bay	24.58	23.01	10.47	24.34	8.19	1.52	1.83	9.34	-	-	-	0.28	-	4.99	10.86	9.18
Lynn Sisters	4.72	10.65	11.42	5.30	1.48	2.30	1.52	0.39	-	-	-	0.48	-	0.38	3.86	3.94
Funter Bay	3.11	-	-	26.91	46.53	4.65	9.00	6.70	-	-	-	-	-	-	16.15	17.21
Hawk Inlet	53.22	-	-	161.55	43.44	60.60	11.25	14.54	-	-	-	-	-	-	57.43	54.84
Excursion Inlet	21.77	3.05	7.19	2.92	0.56	1.73	1.65	0.17	0.53	-	0.75	0.73	-	0.75	3.48	5.82
Port Frederick	11.18	1.31	9.61	10.37	2.52	8.70	6.69	4.55	-	-	0.65	0.84	-	0.59	5.18	4.05
Iyoukeen Cove	84.87	0.00	0.00	0.00	5.28	1.15	0.00	0.00	-	-	-	-	-	-	11.41	29.74
Freshwater Bay	5.28	0.00	7.25	6.50	1.93	0.11	0.00	-	-	-	-	-	-	-	3.01	3.24
Sitkoh Bay	15.10	-	63.53	14.92	4.38	0.00	-	0.14	-	-	-	-	-	-	16.35	24.10
Rodman Bay	7.09	-	6.13	12.05	7.33	8.42	3.00	0.08	-	-	-	-	-	-	6.30	3.85
Deadman Reach	5.77	1.70	6.49	8.03	13.98	9.58	14.46	3.76	14.81	11.19	3.86	5.57	8.14	17.16	8.89	4.61

^a The survey design was changed in 1986 from a set station pattern to stratified and random pot sets.

^b Average is not a weighted average.

Table 9d. Stratified mean index survey CPUE values of juvenile female red king crab by bay and survey for the years 1979 through summer 1991. Data standardized for a 24-hour soak.

Location	1979	1980	1981	1982	1983	1984	1985	1986 ^a	Sum. 1987	Fall 1987	Sum. 1988	Fall 1988	1989	1991	Average Index Survey CPUE Value By Bay ^a	Standard Deviation
Farragut Bay	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	-	-	-	-	-	-	0.09	0.21
Pybus Bay	3.92	1.90	0.54	0.03	0.07	0.00	0.00	0.00	0.00	0.07	-	0.00	-	0.00	0.54	1.15
Gambier Bay	0.85	4.87	3.62	0.95	0.36	0.00	0.00	0.15	-	-	2.63	0.67	0.45	1.90	1.37	1.51
Seymour Canal	0.12	1.90	2.13	0.06	0.13	0.46	0.06	0.03	-	-	0.00	0.93	0.83	0.05	0.56	0.72
Young Bay	0.00	0.00	0.48	0.00	0.00	0.00	0.23	-	-	-	-	-	-	-	0.10	0.19
Barlow Cove	3.92	1.98	0.65	0.10	3.32	0.79	2.42	18.01	0.82	8.28	13.54	3.03	14.57	8.14	5.68	5.67
Eagle River	19.94	2.83	3.11	0.00	0.00	0.09	1.50	0.09	0.46	-	-	4.19	-	1.77	3.09	5.51
St. James Bay	0.47	0.07	0.73	0.00	1.33	0.50	0.00	0.25	-	-	-	2.87	-	0.00	0.62	0.85
Lynn Sisters	0.27	3.50	0.33	0.72	0.00	0.05	0.00	0.04	-	-	-	0.00	-	0.00	0.49	1.03
Funter Bay	0.28	-	-	0.50	1.50	0.00	0.25	11.13	-	-	-	-	-	-	2.28	4.37
Hawk Inlet	29.38	-	-	0.53	0.37	6.56	0.13	0.55	-	-	-	-	-	-	6.25	11.60
Excursion Inlet	7.75	1.22	1.28	0.09	0.00	0.04	0.00	0.69	0.32	-	0.37	0.07	-	0.07	0.99	2.08
Port Frederick	4.29	0.50	1.21	0.16	0.00	0.15	1.60	1.32	-	-	0.08	0.00	-	0.16	0.86	1.22
Iyoukeen Cove	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	0.07	0.20
Freshwater Bay	0.70	0.00	0.45	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	0.16	0.29
Sitkoh Bay	0.57	-	1.98	0.70	0.00	0.00	-	0.00	-	-	-	-	-	-	0.54	0.77
Rodman Bay	6.34	-	0.33	0.00	0.23	0.00	0.00	0.00	-	-	-	-	-	-	0.99	2.36
Deadman Reach	0.74	0.10	0.42	1.04	3.14	2.23	1.38	0.69	1.03	1.74	1.10	6.34	4.35	2.62	1.92	1.66

^a The survey design was changed in 1986 from a set station pattern to stratified and random pot sets.

^w Average is not a weighted average.

Table 10. Statistical Area A (Southeast Alaska) summary of male red king crab harvest data, 1979/80 to 1984/85 seasons, and projected harvests using data from last full abundance survey in summer 1991.

Dist.	High Harvest	High Year	Low Harvest	Low Year	Average Harvest	Index Bay Locations	Percent Relative Index Value	Potential Harvest High	Potential Harvest Low	Potential Harvest Average
1-7	32.7	81/82	0.9	84/85	12.3	None	100.0	32.7	0.9	12.3
8	27.6	80/81	0.5	79/80	6.2	None	100.0	27.6	0.5	6.2
9	32.1	83/84	0.1	81/82	12.9	None	100.0	32.1	0.1	12.9
10	168.4	79/80	58.7	84/85	110.3	Pybus/Gamb.	32.8	55.3	19.3	36.2
11	220.2	79/80	35.2	83/84	118.8	Sey/Bar/Eagle	62.4	137.5	22.0	74.2
12	98.0	82/83	7.9	80/81	37.1	Lynn Sisters	48.0	47.0	3.8	17.8
13	116.7	81/82	46.7	83/84	73.1	Deadman	121.8	142.1	56.9	89.0
14	89.1	79/80	5.2	80/81	51.0	Exc/Port Fred	19.6	17.5	1.0	10.0
15	52.8	81/82	1.9	83/84	22.0	St. James/Eagle	69.9	36.9	1.3	15.4
16	0.0		0.0		0.0	None	100.0	0.0	0.0	0.0
Total	837.5		157.2		443.7			528.6	105.8	274.0

ASSUMPTIONS: Stock condition in bays surveyed are representative of all bays in that district; where more than one bay represents a district they contribute equally to the commercial harvest. Where data is not available we assume a percent relative index of value of 100.

RELATIVE INDEX VALUE: Determined by formula: Index survey CPUE Value of Legal Crab - divided by - Average Index Survey CPUE Value (1979 - 1984 only) times - 100.

Bay Relative Index Value

Pybus Bay	=	0.37/3.68	x	100	=	10.05
Gambier Bay ^v	=	2.73/4.91	x	100	=	55.60
Seymour Canal ^v	=	2.44/1.90	x	100	=	128.42
Barlow Cove ^v	=	1.20/6.67	x	100	=	17.99
Eagle River	=	0.87/2.15	x	100	=	40.47
St. James Bay	=	2.53/2.55	x	100	=	99.22
Lynn Sisters	=	2.00/4.17	x	100	=	47.96
Excursion Inlet	=	0.38/1.58	x	100	=	24.05
Port Frederick	=	0.34/2.25	x	100	=	15.11
Deadman Reach ^v	=	2.19/1.80	x	100	=	121.67

District Percent Relative Index Values

District 1-9	=	100.0
District 10	Pybus/Gambier Average	= 32.8
District 11	Seymour/Barlow/Eagle Average	= 62.4
District 12	Lynn Sisters only	= 48.0
District 13	Deadman Reach only	= 121.8
District 14	Exc/Port Frederick Average	= 19.6
District 15	St. James/Eagle Average	= 69.9
District 16	None	= 100.0

REPORT TO THE BOARD OF FISHERIES

1991/92 SOUTHEAST ALASKA

BROWN KING CRAB FISHERIES



By

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and
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**Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska**

December 1992

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INTRODUCTION

This chapter of the Region 1 shellfish report describes the commercial brown king crab fishery in Southeast Alaska (Statistical Area A) with emphasis on activities which occurred during the 1991/92 commercial fishing season. A review of the brown king crab fishery is presented through a discussion of catch and effort history, regulation development, and available population structure information.

Brown king crab, *Lithodes aequispina*, are harvested from the relatively unprotected straits and sounds of the northern portion of Southeast Alaska at depths generally between 100 and 350 fathoms. Important brown king crab fishing grounds are located at the confluences of Icy Strait, Lynn Canal and Chatham Strait; where Chatham Strait and the western portion of Frederick Sound join; and where Stephens Passage and Frederick Sound meet. Small numbers of brown king crab are also landed from other waters of Southeast Alaska. The brown king crab fishery is more demanding than the red king crab, *Paralithodes camtschatica*, or Tanner crab, *Chionoecetes bairdi*, fisheries because of the difficulties associated with fishing in areas more exposed to adverse weather conditions, greater depths, strong tidal exchanges, and heavy currents. Vessels which participate in this fishery are primarily salmon tenders, limit seine vessels, and some larger gillnet vessels. Gear utilized is generally limited to the heavier side-loading king crab pots (7' x 7' x 30") and top-loading pyramid or conical style king crab gear, which is stackable.

The current brown king crab management approach is based on a year around season which opens concurrent with the tanner crab fishery, the harvest of only male crab, a minimum legal size of 7 inches in carapace width, and a seasonal guideline harvest range (GHR) based on historic harvests and fleet input, some gear restrictions, and a limited entry program.

FISHERY DEVELOPMENT AND HISTORY

Commercial king crab fishing in Southeast Alaska waters was initially documented in 1960 when a small harvest occurred in the Petersburg-Wrangell Management Area. Information is not sufficient to distinguish what portion of the early harvests was brown king crab. However, documentation in available area management reports identifies that in some management areas brown king crab comprised up to 45% of the total harvest of all king crab species. Information is not adequately detailed to identify district harvests by species for these early fishing years. By 1972, adequate information on the brown king crab component of the total king crab harvest, number of vessels and number of landings was available (Table 1). This information was also detailed by month (Table 2) and district (Table 3).

By January 1976, accurate species information was required on fish tickets, and this information provides the primary source of accurate information currently used in managing the fishery. In addition, dockside sampling of landed catches and interviews of skippers have been conducted in the fishery to obtain stock structure (Table 4) and CPUE information (Table 5). Dockside sampling was incomplete from 1970 through 1983. Data collected since 1984 have been adequate to infer stock condition. Research on life history or abundance of brown king crab is not conducted through ADF&G projects, with the exception of a small growth study that was accomplished during the early 1970's.

From calendar year 1961 through the 1971/72 fishing season, harvests of all king crab species averaged 835,200 lbs per year (or season), with an average of 14 vessels participating. Approximately 375,000 lbs of this average harvest was composed of brown king crab, with the remainder being red king crab.

Since the 1972/73 fishing season, harvests of brown king crab have averaged about 488,600 lbs of crab with an average of 41 vessels participating (Table 1). Based on current prices, this average brown king crab harvest would have an approximate exvessel value of \$1,500,000. Peak effort occurred during the 1984/85 season when 124 vessels participated for a total harvest of 848,818 lbs. Peak harvest occurred during the 1986/87 season when 1,016,011 lbs were landed by only 51 vessels. This peak harvest would have an exvessel value of \$3,200,000 using current prices.

There are four general phases that characterize the development of the brown king crab fishery in Southeast Alaska. The first phase occurred from the inception of the fishery in 1960 through the 1971/72 fishing season. This phase could be called the development phase of the fishery and could best be characterized when fishermen determined which fishing methods, gear types, depth ranges, geographic areas, and other factors yielded adequate harvests of brown king crab. Processing facilities developed product forms, marketing occurred and prices were generally low during this time period. Effort levels were relatively low and harvests fluctuated. For most fishermen the target species may have been red king crab. Basic regulations establishing quotas, gear limits, and other major regulations were developed during this time. These regulations were primarily based on a short history of commercial fishing, little biological information, and the experiences in other Alaskan king crab fisheries. The first emergency order closure was initiated during the 1971/72 fishing season due to poor harvests after a 4.5 month season. The main benefit of development phase was to identify the upper limit harvest capabilities of the stock and the need for some basic fishery regulation. Although catch and effort data are not complete, it is probably valid to state that brown king crab harvests approaching 800,000 lbs per season were not sustainable. The remaining phases can be separated by reviewing the catch and effort data on Table 1.

The second phase began with the 1972/73 fishing season and extended through the 1978/79 fishing season. This phase entailed a rather low level of effort which averaged about nine permits per season with variable harvests which averaged 103,725 lbs per season. During this period harvests ranged between 34,451 lbs

and 265,310 lbs. The average landing was comprised of 1,712 lbs during this phase. The major contribution from this phase was a further development of the gear and fishing techniques and further information on the distribution of the species.

The third phase began with the 1979/80 fishing season with only 19 permits fished, and it ranged through the peak effort level of 124 permits fished during the 1984/85 fishing season. An average of 64 permits was fished during this period, resulting in an average seasonal harvest of 688,261 lbs. The average landing was 3,078 lbs during this period. This phase is important in that it showed a consistent harvest of almost 690,000 lbs. Many fishermen that utilized the resource during this period may have been anticipating limited entry in the fishery, and could have been participating in order to obtain points for a future fishing permit. Thus, the high effort available helped to define the limits of stock with respect to geographic distribution (Table 3) and harvest levels.

The fourth phase began with the 1985/86 fishing season and continues today. An average of 52 permits have fished since the 1985/86 fishing season with a resulting harvest which has averaged 702,357 lbs. The peak harvest of 1,016,011 lbs by 51 permits and the peak average of 4,579 lbs also occurred during the 1986/87 fishery. The fishery was separated into four management areas after the 1986/87 fishery in an effort to prevent overfishing of the stock from any single management area and to distribute the harvest over more geographic area. Since this peak harvest occurred, effort has declined to only 33 permits, while the average catch per landing has declined to less than 1,500 lbs per landing. Seasonal harvests have also declined. It is important to note that for the past five seasons, opening dates for the brown king crab fishery have remained constant since the 1985/86 fishing season and have not been influenced by effort shifts to red king crab, since the red king crab fishery was last open during the 1984/85 fishing season.

REGULATION DEVELOPMENT

Fishing Season

Regulation development in the brown king crab fishery has generally paralleled that of the red king crab or Tanner crab fisheries in Southeast Alaska. Biological information which identifies specific molting and mating periods, or other sensitive life history stages have not been collected for brown king crab. Available information suggests that low level molting occurs throughout the year with no specific peak molting, or growth, activity. The presence of eggs in all stages of development throughout the year also support no distinct molting or mating period. Thus, seasons have been quite liberal for this commercial

fishery. From 1961 through 1968 there was no closed season. Closures had been established primarily to provide fair start opportunities associated with the red king crab and Tanner crab fisheries.

Prior to the 1969/70 king crab fishing season, a closed period from March 16 through August 14 was established by the Alaska Board of Fisheries. In 1971 the separation of the brown king crab fishery from the red king crab fishery was established by the Board through regulation changes. As the season for red king crab became more restrictive, a year long season from August 1 through the following July 31 continued in the brown king crab fishery. An emergency order closed the brown king crab fishing season on April 30, 1972 in District 10 (Frederick Sound).

During the 1972/73 and 1973/74 seasons, fishing began on August 1 and closed about nine months later. From the 1974/75 season through the 1981/82 season the fishery was basically a year around endeavor, with the exception of a two and one-half month summer closure in Frederick Sound. Fishing started on dates ranging between August 1 and October 1. The change in dates coincided with the opening dates of the red king crab fishery, which was developing at a faster rate than the brown king crab fishery. Those vessels fishing certain grounds during the summer months were required to have a special written permit issued by the local ADF&G office.

From 1982/83 through 1987/88 a split season existed. Approximately one-half of the guideline harvest range (GHR) was allocated to be taken during the red king crab season which generally started in early October or November. The remainder of the GHR was taken concurrently with the Tanner crab fishery which began on early February or January. During the 1985/86 through the 1987/88 fishery there was no fall allocation because the red king crab fishery was closed. As a result, the entire GHR was available for harvest at the beginning of the Tanner crab fishery.

Beginning with the 1987/88 fishing season and extending to the present day, separate GHRs were established for each major fishing area now described in the regulation booklet (Frederick Sound, Icy Strait, Chatham Strait). Some minor changes in the boundaries of these areas have occurred to allow the harvest to be recorded in the proper statistical reporting areas. The separation into the present management areas was accomplished to prevent overexploitation of any single fishing ground. An Exploratory Area without a GHR was also established, in which fishing is allowed throughout the year, with the exception of a small closure before the Tanner crab season for enforcement reasons. The fishing season has started on either January 15 or February 15 since the 1987/88 fishing season, and occurs concurrently with the Tanner crab season. Current regulations establish a starting date of February 15, with closure to occur on January 29, unless the season is closed earlier by emergency order (EO) due to biological considerations or the attainment of the established GHRs.

Sex and Size Limits

From its inception, this fishery has been restricted to harvesting only male crab in order to protect the reproductively important females. From 1961 through 1968, a minimum legal size of 6 1/2 inches in carapace width existed. The minimum legal size was implemented to protect sexually mature male brown king crab from harvest during the early years of sexual maturity. Before the 1969/70 season, the minimum legal carapace width was increased to 7 inches in response to Gulf of Alaska growth and size at maturity information for red king crab. This regulation was implemented to provide additional reproductive protection to the male portion of the stock. Information available from red king crab suggest that the reproductive protection afforded by minimum size regulations may not be as complete as previously thought.

Average size at maturity for male brown king crab from Southeast Alaska is not known. With the absence of this important piece of biological information, it has been assumed that the size of maturity for male brown king crab is the same as for male red king crab. This assumption was made because: (1) size at maturity for red king crab in Kodiak is known as 145 mm of carapace length; (2) growth information for Southeast Alaska red king crab are very similar to Kodiak red king crab; and (3) growth increments are very similar for both species in Southeast Alaska. Known regression formulae relating carapace length to width for brown king crab in Southeast Alaska were used to establish the correct legal width measurement.

Regulations provide that the minimum legal carapace width can be increased to 8-inches by emergency order if warranted by stock structure information. However, information concerning the structure of the prerecruit portion of the stock is not available, and this regulation has not been utilized in Southeast Alaska.

Quotas and Guideline Harvest Ranges

From 1960 through 1969, harvest limits were not established in regulation or utilized through management actions. In 1970 a quota of 1,500,000 lbs was provided for combined harvests of all species of king crab. In 1971 this quota was separated into portions for red and brown king crab, and a quota of 600,000 lbs was established for the brown king crab fishery. This quota remained in regulation through 1977. Actual harvests from the 1972/73 through the 1976/77 fishing seasons peaked at 265,310 lbs during the 1972/73 fishing season, and averaged approximately 118,000 lbs each season.

The 600,000 lb quota was replaced with a GHR of 50,000 to 200,000 lbs prior to the 1978/79 season. Guideline harvest ranges provide more flexibility to management, and they more accurately reflected historic catch ranges. This GHR remained in effect through the 1980/81 fishing season. During these three seasons harvests averaged almost 300,000 lbs. Also, this period reflected a significant increase in effort from 14 to 54 permits fished, which resulted in a tremendous increase in harvests. The peak harvest during this period was 683,298 lbs during the 1980/81 fishing season.

The GHR was increased to 200,000 to 500,000 lbs prior to the 1981/82 fishing season, and this GHR remained in place through the 1986/87 fishing season. Effort, expressed as number of permits actually fished, continued to increase to a peak of 124 permits during this time. A significant recruitment event began to enter the fishery during the 1983/84 fishing season harvests. The combined effect of increased effort and a significant recruitment event resulted in a very significant increase in seasonal harvests. Seasonal harvests from the 1982/83 through the 1986/87 seasons averaged 868,819 lbs, with a range of 697,710 to 1,106,011 lbs.

Due to the propensity of the fleet to concentrate effort in the most productive fishing grounds rather than to distribute effort over all fishing grounds, and to prevent overexploitation on any single fishing ground, separate GHRs were established for specific fishing areas prior to the 1987/88 fishing season. The fishing areas and GHR were:

(1) Frederick Sound	200,000 to 325,000 lbs;
(2) Icy Strait	150,000 to 250,000 lbs;
(3) Lower Chatham Strait	200,000 to 250,000 lbs;
(4) Exploratory	No GHR was established.

These GHRs were based upon the harvests and ranges in harvests that had occurred in each fishing area since the 1975/76 fishing season. This action was taken through a preliminary management plan.

Prior to the 1988/89 fishing season, the Alaska Board of Fisheries established regulations to describe the actual fishing grounds and set GHRs for each fishing ground. Due to industry input, the GHRs were increased for Frederick Sound and Chatham Strait and set as:

(1) Frederick Sound	200,000 to 500,000 lbs;
(2) Icy Strait	150,000 to 250,000 lbs;
(3) Chatham Strait	200,000 to 350,000 lbs;
(4) Exploratory	No GHR was established.

These GHRs exist today.

Fishing Gear

From 1961 through 1967 the number of pots that could be fished by an individual permit or vessel participating in the fishery was not limited and no general specifications associated with the gear were in effect. In 1968 a limit of 40 pots per vessel was established. This limit was increased to 60 in 1974, and once again to 100 pots in 1978. This pot limit continues in effect.

Prior to the 1969/70 fishing season pot storage in the water was allowed. Regulations do not provide for a minimum mesh size or other biologically justified specifications, except that a "pot destruct" mechanism is required in case the pot is lost. Each pot must be independently buoyed and comply with marking requirements.

Limited Entry

Effective January 1, 1984 a limited entry program was established by the Alaska Commercial Fisheries Entry Commission for the king and Tanner crab pot fisheries in Southeast Alaska. The number of permanent permits granted for this fishery is presently 15. However, there are many interim permits still eligible to be fished as the adjudication process continues. At the current time, 73 total permits (permanent and interim) are eligible to fish during a brown king crab fishery. Prior to the 1990/91 fishing season, ring nets were eliminated as legal gear for king crab by actions of the Alaska Board of Fisheries.

1991/92 SEASON SYNOPSIS

The 1991/92 commercial brown king crab fishery opened concurrently with the commercial Tanner crab fishery on February 15, 1992. The present seasonal harvest of 225,912 lbs was made by 33 permit holders which made 151 landings (Table 1). Effort expended, in terms of number of permits fished, was the lowest recorded since the 1981/82 season. Major fishing areas of Frederick Sound, Icy Strait, and Chatham Strait were closed on May 8, 1992. The Exploratory area will close on the regulatory closure date of January 29, 1993.

Landings averaged only 1,496 lbs, which is the lowest recorded since the 1978/79 fishing season and only 33% of the peak, which occurred during the 1986/87 fishing season. The average number of crabs per

pot lift, was 1.95, based on dockside interviews (Table 5). This was also the lowest value recorded since the 1985/86 fishing season when adequate data were first available.

Significant levels of recruitment did not enter the fishery this past season. The proportion of recruit crab in the harvest was only 26.3%, which is considerably less than the peak of 58.2% experienced in the 1984/85 season when recruitment was very good (Table 4). Average carapace length this season is 174.2 mm and average weight is 7.73 lbs, which are both high compared to values observed during the period of good recruitment which extended from about the 1983/84 through the 1986/87 fishing seasons. Average carapace lengths during those years ranged from 165.3 mm to 169.6 mm and average weight ranged from 6.48 lbs to 7.10 lbs per crab (Tables 4 and 5).

The Frederick Sound Area produced 36% of the total harvest, followed by Icy Strait with 30%, the Exploratory Area with 20%, and the Chatham Strait area with 40%. In terms of effort, 61% of the permits were fished in Frederick Sound, 33% in Icy Strait, 15% in Chatham Strait, and 6% in the Exploratory Area.

Frederick Sound Area

Twenty permit holders made 71 landings from the Frederick Sound Area during the past fishing season (Table 6) which lasted from February 15, 1991 through May 8, 1992. The resultant harvest of 58,480 lbs (Table 6) was the lowest since the separate fishing areas were established prior to the 1987/88 season. The resulting average landing of 824 lbs was also the lowest since the 1987/88 season, and represents a 31% decline over the previous season value. Although the season was closed well before the regulatory closing date, comparative monthly harvest data showed significant declines during the months of February and March relative to those experienced during previous seasons (Table 7). The greatest reduction in harvests occurred in District 10 (Table 8).

A portion of the decline in harvest can be attributed to reduced effort as most of the fleet decided to participate more actively in the concurrent Tanner crab fishery. However, the majority of the harvest reduction can be explained in the "catching up" of previous recruitment during earlier commercial fishing seasons and the relative lack of new recruit crab entering the fishery prior to the fishery opening.

Dockside sampling provides an insight of recruitment events associated with this fishing area. Fairly good, although sporadic, recruitment occurred in the Frederick Sound Area during the mid-1970's, and excellent recruitment appeared to enter this fishing area from the 1982/83 through the 1986/87 seasons. This is apparent from the relatively high percent of recruit crab (from 40.2 to 68.3%) available during

these seasons (Table 9), which culminated with a peak harvest during the 1988/89 fishing season (Table 6). Good recruitment was also indicated by small average carapace lengths (163.0 to 168.2 mm) and relative low numbers of skipmolted crab (12.7 to 21.6%) during these five fishing seasons (Table 9). The average weight of crab captured during this period of good recruitment was small (6.08 to 6.85 lbs/crab) compared to later seasons when crab averaged over 7 lbs (Table 10). Lastly, the catch from 1985/86 through 1987/88 was consistently above 5 crabs per pot compared to only 1.05 this past season (Table 10). Combined, the size frequency and shell condition data, the weight data, and the CPUE data indicate that a good recruitment event supported the fishery for a 4-6 year period starting with the 1982/83 fishing season. Later recruitment has not been sufficient to provide for higher harvests.

Icy Strait Area

Eleven permit holders made 37 landings from the Icy Strait/Lynn Canal fishing area during this past fishing season (Table 11) which opened on February 15, 1992 and closed on May 8, 1992. The available effort resulted in a total harvest of 48,799 lbs (Table 11), which was the lowest harvest since separate fishing areas were established prior to the 1987/88 fishing season. The landings average of 1,319 lbs was also the lowest (Table 11). All districts showed a reduction in harvests compared to previous seasons (Table 13).

As noted in the Frederick Sound fishery, a portion of the reduced harvests can be attributed to vessels deciding to concentrate fishing effort in the Tanner crab fishery. But, the greatest decline occurred due to the lack of recent recruitment into this fishery.

Samples of dockside landing from this fishing area are very limited, especially for the period of good recruitment from 1984/85 through the 1986/87 fishing seasons. Available samples do indicate that this was a period of good recruitment. Even more dramatic is the lack of recruitment during the past three seasons. Recruit crab accounted for only 7.7% of the harvest this past season, and has been less than 10% for the past three seasons (Table 14). The last significant recruitment entered this fishery prior to the 1986/87 fishery.

The large contribution of post-recruit crab to the harvest was evidenced by the largest average carapace length on record (183.6 mm), a very large percentage of skipmolt crab (38.2%, Table 14), and the highest average weight per crab of (8.84 lbs, Table 15). These data are indicative of an old stock with very little recent recruitment. Low stock abundance is inferred by a continued low reported CPUE this past season (Table 15).

Chatham Strait Area

In terms of geographic area, the Chatham Strait Area is the smallest of the established areas. This area also closed on May 8, 1992. During the 1991/92 fishing season five permit holders fished in this area and made only 11 landings for a total harvest of 23,361 lbs (Table 16). The average catch per landing was only 2,124 lbs (Table 16), which was a small reduction from the previous season's value, but only 35% of the peak value. It was the smallest average catch per landing since the areas were separated. The number of permits has been fairly consistent for the past four seasons, and the number of landings have been high for the previous three seasons. All of the harvest comes from District 109 (Table 18).

Since the number of permits fished has been constant, it does not appear as if declining effort was a significant factor in the harvest decline this season. The number of landings was down from previous levels, primarily due to the closure of the fishery for conservation reasons. Dockside sampling information is not available from which to draw conclusions about stock recruitment. The 1991/92 average carapace length was over 170 mm and the proportion of recruits in the harvest was below 30% (Table 19). Average weight per crab was over 8 lbs (Table 20). The average catch per pot lift increased somewhat over last season's value and the data appear relatively stable, in a statistical sense. These data are similar to data from Frederick Sound and Icy Strait areas, which indicate a lack of recent recruitment.

Exploratory Area

While the Exploratory Area encompasses the greatest geographic area of any brown king crab area, the harvest occurs from a relatively small portion of the open area. Historically speaking, the most significant portion of the harvest has been taken in waters of lower Chatham Strait. Recent harvest data is confidential due to limited effort levels.

Limited dockside sampling information is available for the Exploratory Area, and it is not sufficient to assess recruitment events (Tables 24 and 25). Compared to the three other fishing areas, it is evident that its crab are smaller. During the 1991/92 fishing season the average carapace length of 165.1 mm (Table 24) was small relative to 174.2 mm for all combined area data (Table 4). The largest crab measured in this area was 196 mm (Table 24) compared to 213 mm in the combined areas (Table 4). In addition, the average weight of 6.65 lbs (Table 25) was almost a full pound lighter than the overall Southeast Alaska average of 7.73 lbs (Table 5), and the largest average weight from any single landing was over 3 lbs lighter than the combined data. Although this area remains open through the regulatory closure date of January 29, 1993, effort remains light and a significant increase in harvest is not expected.

1992/93 SEASON OUTLOOK

The only information available to assist management in determining stock strength is fish ticket information, which provides catch and effort data, and dockside sampling data which provides stock structure and limited catch per pot data. These data allow only a postseason assessment of stock condition. Some small differences in data exist between major fishing areas, but the same basic pattern develops in all areas. A review of these data indicate that stock abundance in the major fishing areas of the region is at a low level. Recruitment trends appear to be very similar in all major fishing areas, with the last significant recruitment event starting with the 1982/83 fishing season and extending through the 1986/87 fishing season. It is likely that the abundance of legal brown king crab will continue at a relatively low level, or decline further, unless a significant recruitment enters this fishery. Only continued dockside sampling of this fishery will provide information on future recruitment events and the abundance of this fishery resource.

The most significant portion of the catch decline in recent seasons can be attributed to a decline in the abundance of legal brown king crab. It can be argued that a portion of the decline in harvest last season can be attributed to a decline in effort. Some of the decline in effort may be due to participation in the concurrent Tanner crab fishery. Some of the decline in harvest was due to management action that closed fishing areas prior to the regulatory closure date or before the GHR was reached. The data are not sufficient to determine what portion of the decline in harvest was due to the decline in effort. Both catch and effort, and the stock structure information must be viewed in combination to determine if the decline in harvest was due to a the decline in abundance of legal crab.

Catch and Effort

Catch and effort data (Table 1) indicates that effort, in terms of permits fished, peaked during the 1984/85 fishing season, while the harvest peaked during the 1986/87 season when effort was only 41% of the peak level. Also, catch per landing peaked concurrently with the peak harvest and has declined from 4,576 lbs per landing to only 1,496 lbs per landing last season. The number of landings has generally increased since the 1985/86 fishing season, indicating that fishermen made more trips in an attempt to increase their harvests while the crab population was declining.

Catch per pot information from the dockside sampling program indicated a general decline from an

average of 5.14 legal crab per pot lift during the 1985/86 season to only 1.95 this past season (Table 5). The highest catch per pot reported fell from a level of 16.4 during the 1986/87 season to only 4.00 last season, the lowest on record. In addition, the lowest catch per pot reported fell from 1.58 during the 1985/86 season to 0.18 this past season. These data support the conclusion that the number of legal crab available to the fishery has declined. The condition persists today and will result in low harvests until another significant recruitment enters the fishery.

Stock Structure and Catch Per Pot

Primary data collected during dockside sampling include carapace length, shell condition, and weight. When combined, carapace length and shell condition can be utilized to determine what proportion of the stock is comprised of recruit and post-recruit crab. While not totally quantitative, this information can be utilized to determine when a significant recruitment event enters the fishery, particularly when combined with harvest data. Shell condition, itself, can be an indicator of the relative age of the stock. As king crab increase in age, the tendency to skip-molt increases. A stock with a large proportion of skip molts is an older stock, and this information can also be used to support conclusions on recruitment events. Average weight can be used as an indicator of recruitment events and relative stock age. Lighter crab indicate a significant proportion of recruit crab in the legal stock. Heavier crab indicate a significant proportion of post-recruit crab in the legal stock. Dockside sampling data is summarized in two tables. Table 4 summarizes the size data and the various recruit and post-recruit percentages. Table 5 summarizes the weight sampling data.

Although sample sizes are small during the early seasons, it appears that recruitment was sporadic prior to the 1982/83 fishing season, and that some "catching-up" may have occurred prior to the 1982/83 fishing season. Average carapace length was primarily above 170 mm from the 1970/71 through the 1981/82 fishing seasons, and those below that level were all above 168 mm. The great majority of the harvest was comprised of post-recruit crab, and the percentage of skipmolted crab was generally above 20% of the total sample (Table 4). The average weights per crab were generally above 7.0 lbs, and were as high as 8.75 lbs during some seasons (Table 5). These data are indicative of an older stock, without significant recruitment events of any magnitude.

A significant recruitment event began to enter the fishery prior to the 1982/83 fishery and lasted through the 1986/87 fishery. This was demonstrated by average carapace length consistently below 170 mm, percent of recruit crab consistently above 39.9, and percent of skipmolt crab generally below 20% for these five seasons (Table 4). In addition, the average weight per crab was between 6.48 and 7.10 lbs. It is interesting to note that this recruitment basically supported high harvests for seven fishing seasons.

and some post-recruits from this event may still be supporting the fishery today. This period of recruitment occurred while effort, catch per landing, and harvests all peaked.

Beginning with the 1987/88 fishing season, average carapace lengths increased, the percent of recruits declined, the percent of post-recruits increased, and the average weight per crab increased. This period coincided with declining harvests, a declining catch per landing, and an increased number of landings. Thus, it is the lack of recent recruitment that is responsible for the majority of the decline in harvest. The decline in effort is due to the recognition of a declining abundance by the fleet and a choice to participate in alternative fisheries.

Table 1. Southeast Alaska (Statistical Area A) summary of commercial brown king crab harvest data from fish tickets by accounting year (October through September), 1972/73 to present.^{a/}

Accounting Year	Permits	Landings	Pounds	Lbs/Landing
1972/73	10	113	265,310	2,348
1973/74	14	92	179,520	1,951
1974/75	7	35	34,451	984
1975/76	5	21	39,439	1,878
1976/77	6	30	74,941	2,498
1977/78	14	53	82,733	1,561
1978/79	10	65	49,679	764
1979/80	19	78	163,035	2,090
1980/81	30	147	683,298	4,648
1981/82	54	255	652,865	2,560
1982/83	69	275	806,637	2,933
1983/84	90	307	974,917	3,175
1984/85	124	277	848,818	3,064
1985/86	61	211	697,710	3,306
1986/87	51	222	1,016,011	4,576
1987/88	56	235	949,205	4,039
1988/89	59	228	968,296	4,246
1989/90	63	257	627,810	2,443
1990/91	39	220	426,877	1,940
1991/92 ^{b/}	33	151	225,912	1,496

^{a/} Includes all test fishing and illegal harvest data which has been excluded from Tables 6, 11, 16, and 21.

^{b/} Most recent year's data should be considered preliminary.

Table 2. Southeast Alaska (Statistical Area A) summary of commercial brown king crab harvest data from fish tickets by month and accounting year (October through September), 1972/73 to present.

Accounting Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Total	Landings	Permits Fished
1972/73	18.1	43.7	18.6	22.0	26.3	19.5	35.6	11.0	6.0	11.1	9.6	43.8	265.3	113	10
1973/74	25.6	21.4	15.6	16.5	12.2	24.6	30.9	15.5	0.0	0.0	3.2	13.9	179.4	92	14
1974/75	8.9	4.9	3.2	4.5	1.4	2.8	3.8	0.0	0.0	0.0	0.0	5.0	34.5	35	7
1975/76	16.1	4.8	7.9	*	*	13.2	1.7	*	0.0	0.0	*	*	39.4	21	5
1976/77	*	9.1	*	*	*	9.1	7.5	0.0	0.0	0.0	0.0	*	74.9	30	6
1977/78	*	*	*	*	10.0	11.7	14.3	0.0	0.0	0.0	0.0	*	82.7	53	14
1978/79	*	4.4	8.7	9.7	5.9	5.9	3.7	*	0.0	0.0	*	3.3	49.7	65	10
1979/80	4.7	8.2	4.9	9.0	16.5	34.8	44.9	10.4	*	8.8	0.0	13.9	163.0	78	19
1980/81	30.2	43.2	18.2	79.3	168.7	167.7	85.3	*	*	*	*	14.0	683.3	147	30
1981/82	43.0	41.7	44.0	17.9	65.8	80.9	70.7	20.9	82.0	70.0	55.8	60.2	652.9	255	54
1982/83	173.5	77.3	65.3	0.0	115.8	166.3	15.0	46.8	27.5	35.2	59.8	24.0	806.6	275	69
1983/84	23.7	52.8	11.0	33.7	152.7	303.5	287.7	53.4	32.2	11.0	6.9	6.3	974.9	307	90
1984/85	166.9	250.8	19.9	14.9	117.8	172.5	22.3	19.6	24.9	*	19.1	11.9	848.8	277	124
1985/86	39.9	53.8	41.1	32.1	240.4	249.1	8.6	4.5	14.7	*	*	*	697.7	211	61
1986/87	147.5	80.2	46.3	326.2	136.5	70.5	67.9	39.3	39.0	*	27.8	17.3	1,016.0	222	51
1987/88	13.2	15.2	10.3	264.6	297.4	80.2	64.0	79.0	63.8	29.3	20.1	12.2	949.2	235	56
1988/89	2.6	*	3.3	*	220.9	329.2	122.6	101.1	63.0	44.3	41.8	35.0	968.3	228	59
1989/90	78.8	31.5	6.5	5.9	66.4	145.3	68.2	60.3	55.7	42.2	23.3	43.7	627.8	257	63
1990/91	51.3	14.0	8.4	*	38.1	89.3	67.9	60.0	52.0	14.3	*	11.6	426.9	220	39
1991/92 ^v	18.7	17.7	16.0	10.8	8.7	44.6	56.2	29.6	*	*	*	*	225.9	151	33

^v Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 3. Southeast Alaska (Statistical Area A) summary of commercial brown king crab harvest data from fish tickets by fishing district and accounting year (October through September), 1972/73 to present.

District	Accounting Year																			
	1972/ 1973	1973/ 1974	1974/ 1975	1975/ 1976	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	1980/ 1981	1981/ 1982	1982/ 1983	1983/ 1984	1984/ 1985	1985/ 1986	1986/ 1987	1987/ 1988	1988/ 1989	1989/ 1990	1990/ 1991	1991/ 1992 ^u
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	3.2	*	17.6	10.1	*	*	*	*	*
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	14.1	*	*	*	0.0	0.0	0.0	*
8	0.4	0.1	0.1	0.0	0.0	*	0.0	1.1	1.2	6.1	*	5.4	*	4.6	0.0	*	10.3	*	*	*
9	10.5	0.5	14.9	0.0	*	0.0	0.0	0.0	*	48.8	109.2	135.0	192.3	234.0	609.3	298.0	413.6	231.3	213.3	155.1
10	186.5	149.2	12.3	*	*	73.7	36.7	61.3	204.6	248.0	185.7	222.7	375.9	324.4	298.8	318.6	338.8	146.1	83.2	178.1
11	36.2	24.6	0.7	0.0	*	7.3	6.7	21.8	25.9	48.8	52.6	24.6	34.5	35.6	43.8	36.9	9.1	6.9	18.5	23.2
12	5.8	0.0	5.2	*	*	*	1.3	61.8	169.7	92.9	225.8	438.2	153.3	23.3	*	195.7	140.5	206.0	82.9	108.9
13	0.0	0.6	0.0	*	0.0	*	0.0	0.0	*	6.2	12.9	*	2.5	*	0.0	0.0	0.0	0.0	0.0	1.5
14	2.6	4.1	1.4	0.0	0.0	0.0	*	*	221.7	152.6	151.1	46.5	52.8	24.8	1.5	16.4	37.5	30.2	19.4	45.0
15	23.4	0.4	0.1	*	*	*	*	16.7	53.6	49.4	37.9	93.9	13.1	24.9	16.2	67.0	12.0	8.9	8.7	24.4
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	265.4	179.5	34.7	39.4	74.9	82.7	49.7	163.0	683.3	652.9	806.6	974.9	848.8	697.7	1,016.0	949.2	968.3	627.8	426.9	225.9

^u Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 4. Southeast Alaska (Statistical Area A) summary of commercial brown king crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.^{1/}

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruits ^{2/}	Recruitment				
			Average	Range		% PR +1 ^{3/}	% PR +2 ^{4/}	% PR +3 ^{5/}	% PR +4 ^{6/}	% Skip Molts ^{7/}
1970/71	16	1,244	172.7	142 - 214	29.2	47.3	19.5	3.4	0.6	12.9
1971/72	15	1,594	175.2	150 - 211	18.0	47.7	28.8	5.5	0.1	26.9
1972/73	13	1,236	174.2	149 - 208	25.7	47.2	22.3	4.5	0.2	16.1
1973/74	8	604	173.0	146 - 210	26.7	39.5	28.7	4.7	0.3	28.6
1974/75	1	104	170.4	151 - 204	36.5	52.9	9.6	1.0	0.0	6.7
1975/76	10	934	171.8	145 - 208	36.1	43.1	17.6	3.1	0.1	11.3
1976/77	2	153	168.8	152 - 205	46.4	39.2	12.4	2.0	0.0	16.3
1977/78	8	727	170.0	149 - 201	23.2	39.2	29.3	8.3	0.0	53.9
1978/79	6	498	171.0	145 - 201	35.2	39.8	23.1	1.8	0.0	20.5
1979/80	5	477	169.8	145 - 203	37.1	36.5	18.9	7.3	0.2	32.7
1980/81	21	1,355	171.6	149 - 206	31.2	46.5	18.4	3.9	0.0	20.1
1981/82	7	634	177.7	148 - 214	21.3	43.7	26.7	7.6	0.8	15.1
1982/83	18	1,567	169.8	146 - 204	35.4	43.5	17.6	3.4	0.1	23.9
1983/84	10	703	169.6	150 - 196	40.9	41.3	15.2	2.6	0.0	15.8
1984/85	12	1,368	165.3	148 - 196	58.2	32.1	9.0	0.7	0.0	15.9
1985/86	21	2,106	166.7	149 - 198	48.4	41.2	9.1	1.4	0.0	16.4
1986/87	40	4,327	168.4	143 - 214	39.9	43.7	13.1	3.3	0.0	21.5
1987/88	64	5,733	173.3	148 - 212	20.0	49.9	23.4	6.6	0.0	26.7
1988/89	80	7,924	173.2	145 - 210	24.2	46.5	24.9	4.4	0.1	24.7
1989/90	97	9,031	176.1	146 - 211	18.9	45.8	29.5	5.7	0.1	20.8
1990/91	75	6,916	174.8	146 - 214	24.7	40.9	26.7	7.5	0.2	24.3
1991/92	46	3,884	174.2	148 - 213	26.3	37.4	25.7	10.2	0.5	32.0

^{1/} Summary tables of all dockside sampling data includes data from Tables 9, 14, 19, and 24 plus data collected that could not be assigned to a fishing area.

^{2/} Recruits = all new and soft shell crab ≥151 mm and ≤167 mm carapace length.

^{3/} PR +1 = all new and soft shell crab ≥168 mm and ≤184 mm, and old & very old shell crab ≥151 mm and ≤167 mm, carapace length.

^{4/} PR +2 = all new and soft shell crab ≥185 mm and ≤201 mm, and old ≥168 mm & ≤184 mm, and very old ≥151 mm and ≤167 mm, carapace length.

^{5/} PR +3 = all new and soft shell crab ≥202 mm and all old ≥185 mm and ≤201 mm, and very old ≥168 mm and ≤184 mm, carapace length.

^{6/} PR +4 = all old and very old where carapace length ≥202 mm.

^{7/} Skip molts = all old and very old crab.

Table 5. Southeast Alaska (Statistical Area A) summary of commercial brown king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.^{1/}

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested ^{2/}	Percent of Harvest Sampled ^{3/}
						Average	Range		
1970/71	0								
1971/72	0								
1972/73	0								
1973/74	1					6.91	6.91 - 6.91	25,980	2.32
1974/75	0								
1975/76	1					8.75	8.75 - 8.75	4,507	20.72
1976/77	0								
1977/78	2					7.39	7.20 - 7.58	11,195	6.49
1978/79	0								
1979/80	1					8.75	8.75 - 8.75	18,794	2.54
1980/81	9					7.78	6.55 - 8.78	87,828	1.54
1981/82	2	50	1,368	27.36	27.36 - 27.36	7.16	6.53 - 7.78	91,182	0.70
1982/83	13	1,697	3,482	2.91	1.09 - 5.32	7.04	6.48 - 7.88	114,579	1.37
1983/84	7					7.10	6.28 - 7.63	137,312	0.51
1984/85	15					6.48	5.74 - 7.28	130,990	1.04
1985/86	20	5,857	28,954	5.14	1.58 - 8.68	6.61	5.98 - 8.45	105,554	2.00
1986/87	36	8,707	33,062	4.51	1.57 - 16.40	6.90	6.16 - 8.46	137,566	3.15
1987/88	65	17,626	59,220	3.44	0.09 - 12.69	7.40	6.50 - 10.58	128,216	4.47
1988/89	86	25,765	89,212	3.50	0.43 - 8.98	7.37	5.75 - 8.71	131,439	6.03
1989/90	94	18,049	40,411	2.61	0.32 - 8.84	7.98	6.45 - 9.40	79,260	11.39
1990/91	78	13,573	27,735	2.22	0.31 - 5.29	7.73	6.31 - 10.99	55,224	12.52
1991/92	42	7,774	14,330	1.95	0.18 - 4.00	7.73	6.30 - 9.78	29,225	13.29

^{1/} Summary tables of all dockside sampling data includes data from Tables 10, 15, 20, and 25 plus data collected that could not be assigned to a fishing area.

^{2/} Calculated by dividing fish ticket weight data by dockside sampling average weight per crab data.

^{3/} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

Table 6. Frederick Sound Fishing Area summary of commercial brown king crab harvest data from fish tickets by actual fishing season, 1987/88 to present.

Season	Permits	Landings	Pounds	Lbs/Landing
1987/88	33	61	397,758	6,521
1988/89	40	96	484,127	5,043
1989/90	41	104	176,541	1,698
1990/91	25	117	156,758	1,340
1991/92 ^u	20	61	58,480	959

^u Most recent year's data should be considered preliminary.

Table 7. Frederick Sound Fishing Area summary of commercial brown king crab harvest data by month and actual fishing season, 1987/88 to present.

Season	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total	Landings	Permits Fished
1987/88	218.5	179.3											397.8	61	33
1988/89		207.2	276.9										484.1	96	40
1989/90		63.2	107.1	6.3									176.5	104	41
1990/91		32.6	59.9	31.7	20.1	12.5							156.8	117	25
1991/92 ^u		8.3	25.8	20.9	3.5								58.5	61	41

^u Most recent year's data should be considered preliminary.

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Table 8. Frederick Sound Fishing Area summary of commercial brown king crab harvest data by fishing district and actual fishing season, 1987/88 to present.

Season	106	107	108	109	110	111	112	113	114	115	Total	Landings	Permits
1987/88	*			50,897	318,639	28,215					397,758	61	33
1988/89	*		10,301	127,705	338,123	7,987					484,127	98	40
1989/90			*	25,711	144,180	6,642					176,541	108	41
1990/91	*		*	54,498	83,164	18,138					156,758	132	25
1991/92 ^u			*	24,385	13,059	20,087					58,480	71	41

^u Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 9. Frederick Sound Fishing Area summary of commercial brown king crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruitment					
			Average	Range	% Recruits ^{1/}	% PR +1 ^{2/}	% PR +2 ^{3/}	% PR +3 ^{4/}	% PR +4 ^{5/}	% Skip Molts ^{6/}
1970/71	15	1,117	172.3	142 - 214	29.6	47.3	18.8	3.7	0.6	14.4
1971/72	14	1,496	174.8	150 - 211	19.1	48.9	27.6	4.3	0.1	24.9
1972/73	13	1,236	174.2	149 - 208	25.7	47.2	22.3	4.5	0.2	16.1
1973/74	8	604	173.0	146 - 210	26.7	39.5	28.7	4.7	0.3	28.6
1974/75	1	104	170.4	151 - 204	36.5	52.9	9.6	1.0	0.0	6.7
1975/76	9	847	171.1	145 - 208	37.6	43.1	16.4	2.7	0.1	11.8
1976/77	2	153	168.8	152 - 205	46.4	39.2	12.4	2.0	0.0	16.3
1977/78	0									
1978/79	6	498	171.0	145 - 201	35.2	39.8	23.1	1.8	0.0	20.5
1979/80	4	371	167.3	145 - 199	44.2	35.3	15.6	4.9	0.0	31.0
1980/81	8	643	168.1	152 - 200	38.2	49.5	10.7	1.7	0.0	20.8
1981/82	1	62	166.7	154 - 185	41.9	50.0	6.5	1.6	0.0	24.2
1982/83	3	323	166.9	151 - 191	41.7	40.8	14.1	3.4	0.0	32.2
1983/84	1	122	164.8	152 - 186	59.8	29.5	10.7	0.0	0.0	21.3
1984/85	7	804	163.0	149 - 184	68.3	26.8	4.8	0.1	0.0	14.2
1985/86	12	1,369	166.6	149 - 198	49.8	42.2	7.4	0.6	0.0	12.7
1986/87	17	1,955	168.2	143 - 210	40.2	44.2	11.6	4.0	0.1	21.6
1987/88	18	1,764	170.7	150 - 200	23.7	52.6	18.8	4.9	0.0	28.6
1988/89	41	4,271	170.9	147 - 210	30.5	46.8	20.5	2.2	0.0	23.3
1989/90	37	3,618	174.4	150 - 210	20.4	48.3	26.5	4.8	0.0	24.6
1990/91	29	2,516	174.7	147 - 214	22.8	44.1	26.2	4.7	0.2	25.3
1991/92	16	1,315	172.1	150 - 209	23.2	45.2	24.0	7.2	0.4	38.2

^{1/} Recruits = all new and soft shell crab ≥151 mm and ≤167 mm carapace length.

^{2/} PR +1 = all new and soft shell crab ≥168 mm and ≤184 mm, and old & very old shell crab ≥151 mm and ≤167 mm, carapace length.

^{3/} PR +2 = all new and soft shell crab ≥185 mm and ≤201 mm, and old ≥168 mm & ≤184 mm, and very old ≥151 mm and ≤167 mm, carapace length.

^{4/} PR +3 = all new and soft shell crab ≥202 mm and all old ≥185 mm and ≤201 mm, and very old ≥168 mm and ≤184 mm, carapace length.

^{5/} PR +4 = all old and very old where carapace length ≥202 mm.

^{6/} Skip molts = all old and very old crab.

Table 10. Frederick Sound Fishing Area summary of commercial brown king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested	Percent of Harvest Sampled
						Average	Range		
1970/71	0								
1971/72	0								
1972/73	0								
1973/74	1					6.91	6.91 - 6.91		
1974/75	0								
1975/76	1					8.75	8.75 - 8.75		
1976/77	0								
1977/78	2					7.39	7.20 - 7.58		
1978/79	0								
1979/80	0								
1980/81	3					6.96	6.55 - 7.40		
1981/82	1					6.53	6.53 - 6.53		
1982/83	3	47	250	5.32	5.32 - 5.32	6.79	6.48 - 6.97		
1983/84	1					6.28	6.28 - 6.28		
1984/85	6					6.08	5.74 - 6.46		
1985/86	12	4,392	22,394	5.21	1.58 - 7.51	6.53	5.98 - 8.45		
1986/87	17	5,166	21,775	5.10	1.90 - 16.40	6.85	6.35 - 8.46		
1987/88	20	5,856	29,884	5.59	0.22 - 12.69	7.17	6.50 - 8.02	55,475	3.18
1988/89	42	14,090	54,921	3.95	1.33 - 8.98	6.94	5.75 - 8.10	69,759	6.12
1989/90	37	7,314	14,416	2.11	0.65 - 4.86	7.62	6.45 - 9.20	23,168	15.62
1990/91	28	5,510	8,060	1.38	0.31 - 3.46	7.54	6.52 - 8.86	20,790	12.10
1991/92	16	2,950	2,968	1.05	0.18 - 2.17	7.45	6.89 - 8.66	7,850	16.75

Table 11. Icy Strait/Lynn Canal Fishing Area summary of commercial brown king crab harvest data from fish tickets by actual fishing season, 1987/88 to present.

Season	Permits	Landings	Pounds	Lbs/Landing
1987/88	36	114	285,487	2,504
1988/89	27	110	260,781	2,371
1989/90	27	92	187,052	2,033
1990/91	16	51	96,286	1,888
1991/92 ^u	11	37	48,799	1,319

^u Most recent year's data should be considered preliminary.

Table 12. Icy Strait/Lynn Canal Fishing Area summary of commercial brown king crab harvest data by month and actual fishing season, 1987/88 to present.

Season	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Total	Landings	Permits Fished
1987/88	43.5	71.0	46.1	28.2	27.7	49.6	*	*						285.5	114	36
1988/89		3.0	29.5	57.4	48.5	26.7	9.3	*	*	43.0	16.2	*	*	260.8	110	27
1989/90		1.2	21.0	41.6	40.6	31.7	18.5	2.9	14.9	11.7	3.0			195.5	92	27
1990/91		3.4	12.4	24.9	31.4	24.3								96.3	51	16
1991/92 ^v		.4	12.8	27.9	7.7									48.8	37	11

^v Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 13. Icy Strait/Lynn Canal Fishing Area summary of commercial brown king crab harvest data by fishing district and actual fishing season, 1987/88 to present.

Season	106	107	108	109	110	111	112	113	114	115	Total	Landings	Permits
1987/88						8,695	193,441		16,361	66,995	285,487	114	36
1988/89						1,177	205,852		38,142	15,610	260,781	110	27
1989/90						149	151,829		29,522	5,552	187,052	92	27
1990/91						345	68,460		19,350	8,131	96,286	51	16
1991/92 ^v						493	35,136		9,188	3,982	48,799	37	11

^v Most recent year's data should be considered preliminary.

Table 14. Icy Strait/Lynn Canal Fishing Area summary of commercial brown king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruitment					
			Average	Range	% Recruits ^{1/}	% PR +1 ^{2/}	% PR +2 ^{3/}	% PR +3 ^{4/}	% PR +4 ^{5/}	% Skip Molts ^{6/}
1970/71	1	127	175.5	145 - 204	26.0	47.2	26.0	0.8	0.0	0.0
1971/72	1	98	181.5	158 - 200	0.0	30.6	45.9	23.5	0.0	57.1
1972/73	0									
1973/74	0									
1974/75	0									
1975/76	1	87	178.2	149 - 205	20.9	43.0	29.1	7.0	0.0	6.9
1976/77	0									
1977/78	0									
1978/79	0									
1979/80	1	106	178.4	156 - 203	14.3	39.0	29.5	16.2	1.0	37.7
1980/81	13	712	174.7	149 - 206	24.8	43.8	25.5	5.9	0.0	19.5
1981/82	5	471	179.4	148 - 214	18.4	40.0	30.6	9.9	1.1	17.2
1982/83	13	1,044	170.3	146 - 204	34.8	44.2	17.3	3.6	0.1	21.2
1983/84	8	479	170.2	150 - 196	39.1	42.9	15.7	2.3	0.0	12.1
1984/85	5	564	168.5	148 - 196	43.8	39.5	15.1	1.6	0.0	18.4
1985/86	2	110	167.0	151 - 192	45.9	37.8	10.8	5.4	0.0	21.8
1986/87	1	22	168.2	156 - 181	40.9	45.5	9.1	4.5	0.0	18.2
1987/88	23	1,930	177.8	152 - 212	11.6	49.9	29.6	8.9	0.0	21.3
1988/89	23	2,085	177.4	147 - 210	13.1	45.8	33.0	8.1	0.1	26.4
1989/90	28	2,392	180.3	150 - 205	9.2	40.6	40.9	9.2	0.1	23.9
1990/91	14	1,312	182.4	150 - 213	5.5	30.6	47.5	16.0	0.4	37.0
1991/92	16	1,136	183.6	153 - 213	7.7	26.9	41.4	22.8	1.2	38.2

^{1/} Recruits = all new and soft shell crab ≥151 mm and ≤167 mm carapace length.

^{2/} PR +1 = all new and soft shell crab ≥168 mm and ≤184 mm, and old & very old shell crab ≥151 mm and ≤167 mm, carapace length.

^{3/} PR +2 = all new and soft shell crab ≥185 mm and ≤201 mm, and old ≥168 mm & ≤184 mm, and very old ≥151 mm and ≤167 mm, carapace length.

^{4/} PR +3 = all new and soft shell crab ≥202 mm and all old ≥185 mm and ≤201 mm, and very old ≥168 mm and ≤184 mm, carapace length.

^{5/} PR +4 = all old and very old where carapace length ≥202 mm.

^{6/} Skip molts = all old and very old crab.

Table 15. Icy Strait/Lynn Canal Fishing Area summary of commercial brown king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested	Percent of Harvest Sampled
						Average	Range		
1970/71	0								
1971/72	0								
1972/73	0								
1973/74	0								
1974/75	0								
1975/76	0								
1976/77	0								
1977/78	0								
1978/79	0								
1979/80	0								
1980/81	0								
1981/82	1	50	1,368	27.36	27.36 - 27.36	7.78	7.78 - 7.78		
1982/83	10	1,650	3,232	2.31	1.09 - 3.25	7.11	6.63 - 7.88		
1983/84	5					7.18	6.70 - 7.63		
1984/85	6					6.77	6.13 - 7.28		
1985/86	2	275	546	1.99	1.99 - 1.99	7.09	7.09 - 7.09		
1986/87	5	366	200	1.72	1.72 - 1.72	6.50	6.16 - 6.77		
1987/88	22	5,660	10,896	2.33	0.09 - 4.66	7.71	6.96 - 8.64	37,028	5.21
1988/89	26	4,833	11,698	2.83	0.43 - 8.71	8.00	7.15 - 8.68	32,598	6.40
1989/90	27	4,709	10,473	2.46	0.34 - 4.10	8.53	7.62 - 9.42	21,929	10.91
1990/91	15	2,566	4,810	1.98	0.80 - 3.60	8.75	8.21 - 10.99	11,004	11.92
1991/92	13	1,829	3,661	2.32	1.37 - 4.00	8.84	8.24 - 9.78	5,520	20.58

Table 16. Lower Chatham Fishing Area summary of commercial brown king crab harvest data from fish tickets by actual fishing season, 1987/88 to present.

Season	Permits	Landings	Pounds	Lbs/Landing
1987/88	8	28	166,131	5,933
1988/89	8	46	279,336	6,073
1989/90	5	44	185,118	4,207
1990/91	6	46	102,160	2,221
1991/92 ^{a/}	5	11	23,361	2,124

^{a/} Most recent year's data should be considered preliminary.

Table 17. Lower Chatham Fishing Area summary of commercial brown king crab harvest data by month and actual fishing season, 1987/88 to present.

Season	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Total	Landings	Permits Fished
1987/88	*	44.1	33.4	33.7	49.4	*								166.1	28	8
1988/89		*	22.8	57.0	38.1	25.7	26.9	28.6	*	31.6	14.5			279.3	46	8
1989/90		*	*	*	19.8	24.0	23.6	*	25.0	31.7	*			185.1	44	5
1990/91		*	13.8	8.1	*	*	*	*	*	9.9	10.4	*	*	102.2	46	6
1991/92 ^v			*	*	*									23.4	11	5

^v Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 18. Lower Chatham Strait Fishing Area summary of commercial brown king crab harvest data by fishing district and actual fishing season, 1987/88 to present.

Season	106	107	108	109	110	111	112	113	114	115	Total	Landings	Permits
1987/88				166,131							166,131	28	8
1988/89				279,336							279,336	46	8
1989/90				185,118							185,118	44	5
1990/91				102,160							102,160	46	6
1991/92 ^v				23,361							23,361	11	5

^v Most recent year's data should be considered preliminary.

Table 19. Lower Chatham Strait Fishing Area summary of commercial brown king crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruitment					
			Average	Range	% Recruits ^{1/}	% PR +1 ^{2/}	% PR +2 ^{3/}	% PR +3 ^{4/}	% PR +4 ^{5/}	% Skip Molts ^{6/}
1970/71	0									
1971/72	0									
1972/73	0									
1973/74	0									
1974/75	0									
1975/76	0									
1976/77	0									
1977/78	0									
1978/79	0									
1979/80	0									
1980/81	0									
1981/82	0									
1982/83	1	100	170.3	153 - 190	27.5	38.2	29.4	4.9	0.0	41.0
1983/84	0									
1984/85	0									
1985/86	0									
1986/87	1	131	167.6	150 - 185	36.2	55.4	8.5	0.0	0.0	20.6
1987/88	16	1,437	171.2	152 - 198	23.2	48.2	23.0	5.5	0.0	31.9
1988/89	11	4,115	174.0	147 - 207	23.3	47.1	24.2	5.3	0.1	22.4
1989/90	21	2,096	175.6	146 - 211	22.1	49.3	24.9	3.7	0.0	12.3
1990/91	15	1,501	173.1	147 - 211	29.5	46.7	19.5	4.1	0.2	15.7
1991/92	3	315	171.3	152 - 200	26.3	42.5	26.6	4.7	0.0	37.1

^{1/} Recruits = all new and soft shell crab ≥151 mm and ≤167 mm carapace length.

^{2/} PR +1 = all new and soft shell crab ≥168 mm and ≤184 mm, and old & very old shell crab ≥151 mm and ≤167 mm, carapace length.

^{3/} PR +2 = all new and soft shell crab ≥185 mm and ≤201 mm, and old ≥168 mm & ≤184 mm, and very old ≥151 mm and ≤167 mm, carapace length.

^{4/} PR +3 = all new and soft shell crab ≥202 mm and all old ≥185 mm and ≤201 mm, and very old ≥168 mm and ≤184 mm, carapace length.

^{5/} PR +4 = all old and very old where carapace length ≥202 mm.

^{6/} Skip molts = all old and very old crab.

Table 20. Lower Chatham Strait Fishing Area summary of commercial brown king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested	Percent of Harvest Sampled
						Average	Range		
1970/71	0								
1971/72	0								
1972/73	0								
1973/74	0								
1974/75	0								
1975/76	0								
1976/77	0								
1977/78	0								
1978/79	0								
1979/80	0								
1980/81	0								
1981/82	0								
1982/83	0								
1983/84	1					7.54	7.54 - 7.54		
1984/85	0								
1985/86	6	1,190	6,014	5.53	2.92 - 8.68	6.71	6.32 - 7.21		
1986/87	11	2,894	10,182	3.33	1.57 - 4.92	7.07	6.62 - 7.52		
1987/88	15	4,190	12,194	3.13	1.28 - 5.45	7.24	6.72 - 8.05	22,946	6.26
1988/89	14	5,457	17,771	3.38	2.17 - 4.55	7.75	7.12 - 8.71	36,043	11.42
1989/90	23	5,298	13,061	2.99	0.32 - 6.39	8.02	7.00 - 8.92	23,082	9.08
1990/91	16	2,812	7,648	2.98	2.19 - 4.82	7.57	6.86 - 8.33	13,495	11.12
1991/92	1	309	1,008	3.26	3.26 - 3.26	8.12	8.12 - 8.12	2,877	10.95

Table 21. Exploratory Fishing Area summary of commercial brown king crab harvest data from fish tickets by actual fishing season, 1987/88 to present.

Season	Permits	Landings	Pounds	Lbs/Landing
1987/88	6	33	69,876	2,117
1988/89	5	22	55,850	2,539
1989/90	4	20	38,482	1,924
1990/91	7	40	52,645	1,316
1991/92 ^u	*	*	*	2,906

^u Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 22. Exploratory Fishing Area summary of commercial brown king crab harvest data by month and actual fishing season, 1987/88 to present.

Season	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Total	Landings	Permits Fished
1987/88		*	*	*	*	*	17.1	13.2	12.2	*	*	*	*	68.4	32	6
1988/89				8.1	14.4	10.6	8.1	4.4	3.8	3.8	*	*	*	55.9	22	5
1989/90				1.1					3.8	8.0	*	*	*	38.5	20	4
1990/91			*	*		*	*	*	5.0	8.8	7.4	11.3	6.8	52.6	40	7
1991/92 [✓]			.2	2.5	5.8	6.1	7.5	5.9	3.8					32.0	11	2

[✓] Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

2.36

Table 23. Exploratory Fishing Area summary of commercial brown king crab harvest data by fishing district and actual fishing season, 1987/88 to present.

Season	101	106	107	108	109	110	111	112	113	114	115	Total	Landings	Permits
1987/88		*	*		60.1							69.9	33	6
1988/89	0.0	*	*	*	46.2							55.9	22	5
1989/90					38.5							38.5	20	4
1990/91		*	*		47.4							52.6	40	7
1991/92 [✓]					*							*	*	*

[✓] Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 24. Exploratory Fishing Area summary of commercial brown king crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Season	Number of Boats Sampled	Number of Crab Sampled	Carapace Length (mm)		Recruitment					
			Average	Range	% Recruits ^{1/}	% PR +1 ^{2/}	% PR +2 ^{3/}	% PR +3 ^{4/}	% PR +4 ^{5/}	% Skip Molts ^{6/}
1970/71	0									
1971/72	0									
1972/73	0									
1973/74	0									
1974/75	0									
1975/76	0									
1976/77	0									
1977/78	0									
1978/79	0									
1979/80	0									
1980/81	0									
1981/82	0									
1982/83	1	100	174.1	155 - 202	29.0	50.0	20.0	1.0	0.0	8.0
1983/84	0									
1984/85	0									
1985/86	0									
1986/87	0									
1987/88	1	124	167.7	148 - 201	49.6	41.5	8.1	0.8	0.0	8.9
1988/89	2	153	175.2	145 - 201	11.8	43.4	32.9	11.8	0.0	42.5
1989/90	3	301	169.2	150 - 201	47.7	34.9	15.8	1.7	0.0	11.3
1990/91	7	649	166.6	146 - 200	52.3	38.8	7.8	1.1	0.0	10.0
1991/92	6	612	165.1	148 - 196	58.9	33.3	6.8	1.0	0.0	12.7

^{1/} Recruits = all new and soft shell crab ≥151 mm and ≤167 mm carapace length.

^{2/} PR +1 = all new and soft shell crab ≥168 mm and ≤184 mm, and old & very old shell crab ≥151 mm and ≤167 mm, carapace length.

^{3/} PR +2 = all new and soft shell crab ≥185 mm and ≤201 mm, and old ≥168 mm & ≤184 mm, and very old ≥151 mm and ≤167 mm, carapace length.

^{4/} PR +3 = all new and soft shell crab ≥202 mm and all old ≥185 mm and ≤201 mm, and very old ≥168 mm and ≤184 mm, carapace length.

^{5/} PR +4 = all old and very old where carapace length ≥202 mm.

^{6/} Skip molts = all old and very old crab.

Table 25. Exploratory Fishing Area summary of commercial brown king crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested	Percent of Harvest Sampled
						Average	Range		
1970/71	0								
1971/72	0								
1972/73	0								
1973/74	0								
1974/75	0								
1975/76	0								
1976/77	0								
1977/78	0								
1978/79	0								
1979/80	0								
1980/81	0								
1981/82	0								
1982/83	0								
1983/84	0								
1984/85	0								
1985/86	0								
1986/87	3	221	905	7.98	2.73 - 10.61	6.79	6.60 - 6.99		
1987/88	2	900	1,400	1.50	1.00 - 2.00	7.19	7.11 - 7.28	9,718	1.28
1988/89	1	360	1,150	3.19	3.19 - 3.19	8.04	8.04 - 8.04	6,947	2.20
1989/90	3	142	853	6.49	3.83 - 8.84	7.01	6.68 - 7.46	5,490	5.48
1990/91	7	527	1,959	3.66	1.75 - 6.57	6.78	6.31 - 7.23	7,765	8.36
1991/92	5	1,010	2,870	2.87	2.40 - 3.33	6.65	6.30 - 7.03	4,807	12.73

REPORT TO THE BOARD OF FISHERIES
1991/92 SOUTHEAST ALASKA TANNER CRAB FISHERIES



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Division of Commercial Fisheries
Juneau, Alaska

December 1992

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GENERAL BACKGROUND

Of the two commercially significant species of Tanner crab (*Chionoecetes bairdi* and *C. opilio*) harvested from Alaskan waters, only *C. bairdi* is known to be present in Statistical Area A (Southeast Alaska) of Region 1 (Figure 1). Any subsequent reference to Tanner crab in this report will be to *C. bairdi*.

The fishery for Tanner crab is based on the harvest of males over 5 1/2 inches (140 mm) carapace width during a season that is intended to protect sensitive life history stages such as the molting and mating periods. In addition, a guideline harvest ceiling of 2,000,000 lbs, based on historic harvest trends, has been established for this area. Currently, work on a comprehensive management plan for the Area A fishery is underway.

The Southeast Alaska fishery occurs in the relatively protected inshore waters south and east of Cape Fairweather and north of Dixon Entrance. The area is divided into Districts 1 to 16, generally distributed from the south to the north, and it is a superexclusive registration area. Vessels registering to fish Tanner crabs in Area A cannot fish for this species in any other area during the same registration year (August 1 - July 31). The Tanner crab fishery is under limited entry, with a maximum of 89 permits in four permit categories (K49, K59, K69, and T19), some of which are non-transferable.

Most of the vessels used for this fishery are small, generally ranging from 35 to 50 feet keel length, though there are a few vessels with keel lengths up to about 80 feet. Most of the vessels have live-tanks. Most are used primarily for other fisheries during the rest of the year and winter crabbing for Tanner and other crabs is generally pursued as a secondary source of income.

Currently, lighter cone or pyramid stacking pots that occupy less deck space are more commonly used than the heavier, seven-foot square pots originally designed for king crab. The effectiveness of the stacking gear is probably comparable to that of the heavier square pots for Tanner crab, although there is a perception among some members of the fleet that the square pots fish better for king crab. The choice of gear may therefore be predicated on the species to be targeted during mixed species fisheries for Tanner and brown king crab. The recent trend to shorter seasons and declining catches of brown king crab has favored the use of conical or pyramid pots by fishermen increasingly targeting Tanner crab. Soak times have also shortened to one day, particularly during the initial week of the fishery.

Historical Review

General Traditional Pot Fishery

Although Tanner crab landings have been reported in Southeast Alaska since the early 1960's (Table 1), it was not until the early 1970's that intensified fisheries were conducted. Tanner crab were commonly discarded by crabbers well into the mid-1970s, as they targeted the more lucrative red king crab.

Since the 1972/73 season, the Southeast Alaska fishery has produced an average of 1,700,000 lbs per season. Until 1973, the season was open all year (Table 2). From 1974 to 1980, the season lasted from September through either April or mid-May. Regardless of the length of the seasons, most of the harvest was taken during January through April of each year in Districts 110, 111, and 114 (Table 3). These districts generally correspond geographically to the waters of Frederick Sound, Stephens Passage, and Icy Straits, respectively. The regulatory timing and distribution of the fishing effort reflects a combination of crab and vessel availability, market acceptability, and other factors. As the fishery slowly grew in size and intensity, the seasons were correspondingly shortened and regulations became more restrictive. Over the years, pot limits were instituted, registrations and buoy stickers were required, and small areas around Juneau were closed to commercial harvest. The whole process was one of incremental fishery development and corresponding managerial response.

However, the pace changed with the shortened 1981/82 season, when 74 vessels landed a record 3,302,211 lbs between December 1, 1981 and April 16, 1982. About two-thirds of this total was reportedly caught in Icy Straits, where the previous long-term, average harvest had been about 725,000 lbs (Table 3). The next season, climbing demand for Tanner crab, an earlier season opening in Southeast Alaska than in other registration areas to the north and west, open registration, and the record landing in 1981/82, led to 97 vessels entering the fishery. Many larger crab vessels on their way to Kodiak and Bering Sea fisheries also registered for, and fished in, Southeast Alaska.

The effort expended by the fleet in 1982/83, primarily in Icy Straits, was unprecedented (Tables 3 and 4). The season, which lasted two weeks, was closed by emergency order based on extrapolation of early onboard observations of landings in the fishery in Icy Straits. The fishing effort in bays and on the better grounds in Icy Straits was extremely high, the stocks were harvested at very high rates, and the effects were evident in the fishery for the following few seasons. The fishery was barely manageable and several measures to prevent a recurrence were pursued by both the state fishery managers and the local commercial fishing industry.

There was no fishery in calendar year 1983. During its Spring meeting in early 1983, the Board of

Fisheries changed the season opening date in Southeast Alaska to February 10 to match the rest of the state. This action, in itself, discouraged larger vessels from fishing in Southeast Alaska during the 1983/84 season, when more lucrative grounds to the north and west were opening at the same time.

Southeast Alaska was designated a superexclusive registration area during the spring Board meeting in 1985. This action was in response to local reaction to the frantic 1982/83 season, and a further effort to stabilize vessel numbers likely to enter the fishery. It was intended to discourage operators of larger vessels, whose primary sources of income were from crab fisheries in other registration areas, from fishing in Southeast Alaska.

Locally based vessel operators and processors also supported an initiative to further restrict the possibility of a recurrence of the fishery of 1982/83 by requesting limited entry status for the king and Tanner crab fisheries in Southeast Alaska. The State's response was a moratorium, initiated on January 1, 1984, on issuance of new Tanner crab permits. The Commercial Fisheries Entry Commission instituted a complex system of combined permits for the three species of king crab and Tanner crab. The full impact of the moratorium was not felt until the 1985/86 season because many prospective entrants to the 1984/85 fishery, which started on February 10, 1985, had obtained their permits prior to January 1, 1984, the cutoff date for the moratorium on new permit issuance. These measures succeeded in stabilizing the number of vessels in these fisheries. However, the number of vessels allowed was set at a level higher than that before the record-setting 1981/82 season (Table 1) that initiated the move for effort limitation. This proved to have long-term implications, such as progressively shortened seasons as the efficiency of fleet increased.

In 1986, the Board adopted a regulation to restrict the boundaries of Statistical Area A to those waters of the state between Dixon Entrance and Cape Fairweather. A new statistical area, Statistical Area D, was established for those waters between Cape Fairweather and Cape Suckling. Major restructuring of the Administrative Code was necessary to accommodate this change, and implementation of the Board's action was delayed until early in 1987.

The 1987/88 season, which lasted about a month, was the shortest since that of 1982/83. Since the 1982/83 season, each opening has been restricted to less than two months. The general trend has been toward an opening lasting about two weeks, during which the catch has fluctuated between 1,000,000 and 2,200,000 lbs. Port sampling during recent seasons suggested that these levels of harvest generally resulted in harvest rates between 50 and 60% on a regional level, which was sustainable only while recruitment levels remained stable. The risk to this management option arises from the current inability of the department to detect recruitment failure until it is demonstrated by the fishery. Given the available stock condition information and sustainable harvest assumptions, the generally decreasing lengths of recent seasons are a direct indication of the increasing effectiveness of the fleet.

Recent seasons, lasting about two weeks, have resulted in a concentration of effort on the most productive grounds. This fishing strategy is characteristic of a relatively large, efficient fleet faced with a relatively small quota. Many peripheral grounds with harvestable populations are ignored, as the searching of marginal areas for productive pockets becomes increasingly difficult to economically justify.

Experimental Pot Fishery

In response to requests by fishermen, the Board provided for exploratory fisheries for Tanner and red king crab to assess the status of stocks in peripheral or marginal areas that were not fished during the short, regular seasons. Starting in 1988, in areas from which little or no landings had been reported, fishing was allowed for these two species, from July 1 through March 31, under conditions of a special permit. Procedures for managing the experimental fisheries, seasons, and other criteria were established by the Board. In general, these fisheries were allowed when potential for overlaps with traditional fisheries were minimal; that is, during periods between the traditional fishing seasons for red king and Tanner crab. A major assumption was that these fisheries would be of such low intensity that mortalities associated with fishing during known molting and mating periods would be minimal. A special permit and logbook was required because the primary purpose of this fishery was to provide assessments from areas that were not surveyed by the department.

After two seasons of exploratory fishing for red king crab and Tanner crab, it became obvious that interest in these fisheries was very marginal, catches were low, and no major unexploited populations of either species had been found. Also, major abuses of permit conditions and violations of regulations had occurred. As a result, the Board decided during its winter meeting in 1990 to revoke the regulations that provided for these fisheries. The revocation went into effect in late summer 1990.

Ring Net Fishery

With the beginning of the pot permit moratorium on January 1, 1984, newcomers who wished to commercially harvest Tanner crab were limited to ring net gear, which was also defined in the regulations as legal gear. Ring net permits could be requested and issued because the permit moratorium was specific to pot gear. The number of ring net fishermen reporting landings increased from five in the 1984/85 season, peaked at 89 in the 1989/90 season, and has since declined. Total landings increased from 1,451 lbs in the 1984/85 season to 100,896 lbs or 5.11% of the total catch, during the 1989/90 season. The fishery saw a five to six-fold increase in terms of permits used, and a four to five-fold increase in pounds landed in each of the last three seasons. Since the spring meeting in 1986, ring net proposals affecting the Tanner and king crab fisheries have been a recurrent part of Board deliberations. The ring net fishery

was the source of extended deliberations by the Board during the 1990 winter meeting.

In response to the growing ring net fishery and its increasing competition with the limited entry pot fishery, the Board passed a series of regulations intended to minimize conflict between the two gear groups. The number of ring nets was limited to 20 per vessel, ring net marking requirements were defined, and long-lining of ring nets was prohibited. Neither could vessels be concurrently registered for both ring nets and pots. Wording was incorporated to prevent use of ring net gear to conduct preseason test fishing under the guise of subsistence fishing. Ring nets were more carefully defined and limits set for square footage or diameter. The intent of many of these regulations was to constrain ring net harvest below 4% of the total annual harvest of Tanner crab in Southeast Alaska.

Management Strategies for the Southeast Alaska Fishery

Management measures used for the Southeast Alaska Tanner crab fisheries include analysis of historical data trends, development of preseason estimates of season length and appropriate harvest levels, inseason monitoring of catch and effort statistics, and emergency order closures based on harvest rates by major fishing areas. Principal management objectives for this fishery are to avoid pulse fisheries, to discourage high levels of sorting of juveniles and females, and to avoid fishing during sensitive life history stages, such as molting and mating. When a major district needs to be closed for any of these reasons, the entire registration area is closed. It is unfortunate that the variability in stock status between major fishing grounds results in some grounds reaching a harvest level that requires closing the season while others may still be fishable. As a result of conservative management there is a tendency to manage for stocks in the most heavily-fished districts, especially Districts 10, 11, and 14. Relatively strong stocks in these districts, or those that inhabit more lightly fished districts, could sustain higher harvest levels.

Until abundance estimators become available or the Board specifies otherwise, the Tanner fishery will most likely continue to be managed at harvest levels approximating that of the last few seasons. These harvest levels are thought to allow harvest of a significant segment of the legal male population while restraining high sorting levels of sublegal male and female Tanner crab. Maintaining the catch at current levels is also thought to minimize fishing in marginal Tanner crab habitat where their range often overlaps those of red king crab.

Guideline Harvest Ceiling and Maximum Allowable Catch

The Tanner crab fishery is heavily dependent on recruits, and it harvests at least half the available crab

in the same season that they molt to legal size. In the absence of definitive preseason information, the department assumes that the Tanner crab stocks experience fairly stable levels of annual recruitment. If they do, then an annual harvest fluctuating around the long-term average should provide for continued viability of the resource. The annual allowable harvest level is 2,000,000 lbs, specified by regulations. The announced preseason guideline harvest range is often lower than that set by regulation. It is determined largely by recent fleet performance, it is considered to more closely reflect the current status of the stocks, and it is intended to permit a harvest of between 40% and 60% of the legal crab available.

Guideline harvest ceilings and a maximum allowable catch are preseason indicators of management's expectations for the fishery. It is difficult to compare interannual variations in catch because of the rapidly evolving fleet. The actual effectiveness or efficiency of the fleet is probably higher with each season because the permit holders have found it necessary to upgrade their vessels and deck equipment, deploy and work the maximum allowed units of gear, and obtain better electronics to maintain their share of the catch. Competition has fostered the use of tenders to transport fishing gear and crabs, thereby maximizing the time on the grounds by fishing vessels. As a result, management expectations are subject to error and the seasonal length and allowable catch are thus subject to change.

Preseason Management Measures

Management based on analysis of fishery performance is becoming increasingly difficult because of the higher harvest rates by the progressively more efficient fleet. In the future, management will be forced to rely more heavily on a preseason estimate of season length, rather than active inseason data analysis. Preseason measures will be necessary to constrain the harvest to a level below the 2,000,000 lbs directed by regulation, and a 60% harvest rate as directed by policy. Inseason management activities will verify preseason catch rate projections, accumulate catch data, and evaluate unforeseeable variables such as weather and recruitment failure.

Inseason Management Measures

Inseason management activities include a formal port sampling program that allows for examination of the size and shell condition of legal male crab. The tracking of fish tickets provides an estimate of catch per unit effort (catch per vessel per day), changes in this measure of relative abundance, cumulative catch rate, and the total catch to date. Onboard sampling opportunities to examine the relative abundance and sorting rates of juvenile males, females, legal though soft-shelled males, infected crab, and incidentally caught species are limited. Port sampling and fish tickets are the only available sources of information on fleet performance. In the initial stages of the fishery, port sampling provides an indication of the

relative stock strength and the influence of recruiting crab on the total catch. Secondly, interviews provide an overview of the catch per unit effort and biologically important information.

Management by Major Fishing Ground

In the past, harvest data and sampling data were summarized by District. However, major fishing grounds often include only parts of some Districts or overlap at least segments of multiple Districts. In an effort to better define fishing patterns, district and subdistrict landings were combined, as deemed appropriate from past field observations and skipper interview data, to obtain summaries by major fishing grounds (Table 4). Major grounds in Southeast Alaska include Icy Straits, Lynn Canal/Upper Stephens Passage, and Frederick Sound/Lower Stephens Passage. In some cases, e.g.; Icy Straits, the defined fishing ground and District boundaries are similar. However, in other areas, fishing ground boundaries overlap two or more District boundaries and may not include all the subdistricts within a District. The subdistricts included in each of the three designated fishing grounds are listed in Table 5.

Reporting by grounds is a first attempt at examining catch characteristics by major geographical stock rather than the more artificial district reporting system. It is assumed that analysis of grounds data is more indicative of fishing effects on major stocks than District reporting. If resources to conduct surveys by fishing grounds eventually become available, it may be possible to establish harvest rates and quotas for more discrete fishing areas. This would permit harvests at, or near, the most appropriate rate by fishing ground, rather than the present system where the weakest of the major grounds determines the length of the season. Conceivably, this would allow a higher total harvest over time while affording a greater degree of management flexibility.

With the current inability to manage each major fishing area separately, the fishery is managed on the basis of the weakest major fishing area. As the CPUE, catch rate, and participation in the major fishing areas decline, flattening of their cumulative catch curves indicate the harvest of most of the immediately available legal crabs, and a likely increase in the sorting of juveniles, females, and other species. When this point is reached by any of the major fishing areas, the entire fishery is closed by emergency order.

Bitter Crab Syndrome

By the 1984/85 season, a persistent problem of astringent taste in some Tanner crab section meat had been reported. It was thought to be associated with a normal pre-molt condition in Tanner crab. A small scale blood testing project was undertaken to study this problem during the 1985/86 season. It was discovered

that the bitter crab syndrome was caused by a parasitic, systemic dinoflagellate tentatively identified as *Hematodinium* sp.

Bitter crab syndrome has been reported since at least the early 1980's. It has been reported from most major fishing grounds in Southeast Alaska and sporadically from other areas as well. Its definitive identification in Bering Sea Snow crab (*C. opilio*) stocks has accelerated research into its life history and the biochemical aspects of its association with Tanner crab because of the tremendous economic importance of Bering Sea Tanner and Snow crab stocks.

The existence of bitter crab is an important issue because it has biological and marketing implications that are somewhat interrelated. Biologically, the disease is important because it is thought to kill an infected crab within the life cycle of the infective organism, which is currently estimated to be about a year. Also, it may be spread by free-living, infective spores in the autumn, and may be infective to some degree in the vegetative stage while it is resident within the host crab during other seasons of the year. Sick crab that are transported and released in previously unaffected areas could spread the disease. Simply killing the infected crab would not necessarily render it noninfectious because even the vegetative stage of the organism remains viable for a considerable period after the death of the host crab.

Crab in the later stages of infection cannot be marketed because of the bitterly astringent taste and soft texture of the meat. These crab can usually be identified on the fishing grounds by external signs of infection such as abnormal pink or pale coloration of the crab abdomens and the ventral sides of their walking legs.

Infected crab continue to be transported out of the areas in which they are caught for two primary reasons. The first is that many vessel operators or their crews cannot differentiate between infected and healthy crab and retain all legal crab. The second is that the value of Tanner crab is currently sufficiently high now that even those fishermen who can sort infected crab retain all legal-sized male crab for the buyer to sort, rather than risk discarding a crab that would be acceptable to the buyer.

At the present time, the season occurs during a period that is generally felt to be the time of optimum meat condition in the majority of heavily fished stocks. Unfortunately, the season also occurs during a period when crabs infected during the previous year have developed advanced symptoms of the disease, including the characteristic bitter taste. Infected crab, which can be graded visually with a high degree of accuracy at this stage, are unmarketable and they are sorted and discarded by tenders or shore-based processors, and some fishermen.

Sorting rates are reportedly as high as 80% from some areas, and recent increases in reported pounds of deadloss (mostly attributable to disposed diseased crab) indicate the magnitude of the problem. There are

no industry-wide policies, regulations, or standard practices for safe disposal of these unwanted crab. Continued viability of the resource is being risked by the continued transport and often inadequate disposal of infected crab.

A possible partial solution to the transport and disposal problem would be to schedule the season during an earlier stage of the course of infection. Presumably, there is a period during October or early November during which most crab infected the previous year have died and the newly infected crab have not yet developed an unacceptable bitter taste. October or November is acceptable biologically for the harvest of Tanner crab. Preliminary results from analysis of small samples from a limited number of bays suggests that meat recoveries are generally acceptable during this period.

However, although the externally discernible signs, internal symptoms, and mushy meat texture associated with the disease are less pronounced during the October to early November period, they are not totally absent. Meat recovery is also lower during October and November than in February. From the vessel operator's perspective, crab are not as readily caught because they are deeper and less aggregated during October and November than later in the winter. Still, from a biological standpoint, a season that minimizes waste and possibly hazardous disposal of infected crab, is preferable to the current season that maximizes the risk to the continued viability of the resource.

A Tanner crab fishery to evaluate the feasibility of an earlier season to improve the marketability of Tanner crab infected with bitter crab disease was approved by the Board in 1990. Subsequently, it was determined that this fishery would not be manageable and would not provide the information for which it was intended. As a result, it was canceled by emergency order.

Season Summary

The 1991/92 season opened at 12:00 noon AST, on February 15, 1992. It closed by Emergency Order (1-C-5-92) 16 days later at 12:00 noon AST, on March 2, 1992. The preseason harvest limit was announced in a preseason news release at 1,500,000 to 2,000,000 lbs. At the end of the opening, 1,998,454 lbs of marketable crab, plus 110,183 lbs of deadloss, for a total of 2,108,637 lbs, had been caught. Most of the reported deadloss was attributable to rejected bitter crab. At \$2.20/lb., the good product was worth about \$4,400,000, exvessel. The economic loss represented by the deadloss was conservatively set at \$240,000.

A total of 124 permits were fished during the season. They included 83 pot permits and 41 ring net permits. Of the vessels registered for ring net gear, 41 reported landings. A total of 49,272 lbs, or about

2.3% of the Tanner crab catch, were reported landed with ring net gear. This percentage represented a decline from the catches during the past two seasons and remains well within the 4% of the total catch allocated by the Board to the ring net fishery.

Slightly more than 84% of the entire Southeast Alaska catch was reported caught in Districts 110, 111, and 114 (Table 3). This distribution of catch is somewhat typical of recent seasons. The success or failure of the fishery now hinges on these increasingly crowded, heavily fished districts. Trends in landings by district over the past few seasons suggest the interaction between the concurrent fisheries for brown king crab and Tanner crab. As brown king crab stocks declined in areas close to Petersburg, that fleet initially spread in search of alternate brown king crab fishing grounds while opportunistically fishing for Tanner crabs. During the last season, the fleet generally initially targeted Tanner crab in historically productive districts such as Districts 11 and 14. This has been an on-going trend over the past two seasons and reflects a general decline in the brown king crab stocks.

A summary of the catch by fishing area indicated that almost 90% of the total season's harvest was taken from the three major fishing areas. This was the highest percentage taken from the three areas since the frantic 1982/83 season, during which effort concentrated in Icy Strait (Table 5).

Port Sampling Data

Combined port sampling information for the entire region indicated that the average size of crabs was well above average, while the percent of recruits, representing crabs entering the fishery for the first time, was well below the recent period average (Table 4). In conjunction with the data for the past few seasons, this suggests that significant recruitment has not occurred recently, and that management for the coming season will need to closely track the early catches to determine stock strength. Port sampling and fish ticket data also suggest that the catch was well above average in weight, by far the heaviest crabs since the large recruitment event in 1981 (Table 6). The upper end of the range of the catch per pot data was lower than in recent years, as was the average catch per pot. Data from the three major fishing areas (Tables 7-12) reflected the overall data. That is, all the major fishing grounds exhibited generally the same trends as that of the combined regional data. If recruitment did not occur after the fishery in 1992, the 1992/93 fishery could be much less productive than those of the past few seasons.

Table 1. Statistical Area A (Southeast Alaska) commercial Tanner crab catches in pounds, number of vessels, pounds per vessel, number of landings and pounds per landing, 1961 to present.

Season	Catch in Pounds	Number of Vessels	Pounds Per Vessel	Number of Landings	Pounds Per Landing
1961	6,800	-			
1962	7,820	-			
1963	0	-			
1964	13,940	-			
1965	0	-			
1966	-	-			
1967	2,733	-			
1968	109,220	-			
1968/69	176,572	29	6,089	78	2,263
1969/70	660,337	31	21,301	347	1,902
1970/71	167,378	12	13,948	72	2,324
1971/72	656,661	25	26,266	274	2,396
1972/73	1,600,748	31	51,637	354	4,521
1973/74	1,309,673	52	25,186	419	3,125
1974/75	863,751	52	16,611	244	3,539
1975/76	2,149,397	31	69,335	369	5,824
1976/77	2,557,429	57	44,867	380	6,730
1977/78	2,142,409	44	48,691	337	6,357
1978/79	1,559,769	38	41,047	313	4,983
1979/80	1,772,930	53	33,452	355	4,994
1980/81	2,010,370	58	34,662	417	4,821
1981/82	3,302,211	74	44,624	443	7,465
1982/83	1,222,205	97	12,600	181	6,752
1983/84	1,615,100	103	15,681	339	4,764
1984/85	1,125,213	85	13,238	272	4,137
1985/86	1,006,754	84	11,985	320	3,146
1986/87	1,123,974	74	15,189	271	4,147
1987/88	1,330,485	84	15,839	366	3,635
1988/89	1,646,332	140	11,760	388	4,243
1989/90	1,994,496	172	11,596	458	4,354
1990/91	2,241,593	108	20,755	286	7,837
1991/92 ^N	2,108,637	123	17,143	367	5,745

^N Most recent year's data should be considered preliminary.

Table 2. Statistical Area A (Southeast Alaska) commercial Tanner crab harvest in thousands of pounds, by month and season, 1968/69 to present.

Season	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
1968/69	0.0	0.0	0.0	0.0	10.0	8.3	13.1	60.4	35.0	32.9	*	8.6	176.6
1969/70	24.4	30.6	17.5	18.7	19.7	97.2	214.4	149.6	21.1	*	*	*	660.3
1970/71	0.9	*	6.7	7.1	21.3	41.4	56.2	*	0.0	0.0	0.0	0.0	167.4
1971/72	0.0	29.9	31.0	39.0	29.4	17.9	91.6	203.5	148.5	58.5	*	1.0	656.7
1972/73	5.4	42.0	83.8	86.7	50.7	140.8	376.6	554.6	228.7	26.6	*	*	1,600.7
1973/74	29.4	91.8	94.8	87.3	69.5	126.3	314.7	406.2	89.8	0.0	0.0	0.0	1,309.7
1974/75	*	77.2	70.6	56.6	71.6	74.4	180.6	225.8	102.6	Closed	Closed	Closed	863.8
1975/76	13.3	110.3	125.4	107.1	159.7	367.4	634.6	460.0	171.5	Closed	Closed	Closed	2,149.4
1976/77	3.9	76.2	277.0	205.1	338.3	393.8	695.3	458.0	109.9	Closed	Closed	Closed	2,557.4
1977/78	29.4	162.6	139.5	176.0	149.9	303.8	592.5	504.7	84.0	Closed	Closed	Closed	2,142.4
1978/79	6.6	47.6	76.7	91.7	200.1	189.2	465.4	422.3	60.3	Closed	Closed	Closed	1,559.8
1979/80	60.7	55.7	74.5	61.0	153.9	440.0	607.2	282.4	37.5	Closed	Closed	Closed	1,772.9
1980/81	33.7	51.9	48.5	60.1	315.9	494.9	626.9	350.5	28.1	Closed	Closed	Closed	2,010.4
1981/82	Closed	Closed	Closed	870.8	597.7	709.1	809.4	315.2	Closed	Closed	Closed	Closed	3,302.2
1982/83	Closed	Closed	Closed	1,222.2	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	1,222.2
1983/84 ^u	0.0	*	Closed	8.2	0.0	866.0	727.5	Closed	Closed	Closed	Closed	Closed	1,615.1
1984/85	Closed	Closed	Closed	Closed	Closed	531.3	593.9	Closed	Closed	Closed	Closed	Closed	1,125.2
1985/86 ^v	Closed	Closed	Closed	Closed	Closed	575.8	426.4	2.6	Closed	Closed	Closed	Closed	1,006.7
1986/87	Closed	Closed	Closed	Closed	635.4	488.6	Closed	Closed	Closed	Closed	Closed	Closed	1,124.0
1987/88	Closed	Closed	0.0	0.0	787.7	542.8	Closed	Closed	Closed	Closed	0.0	0.0	1,330.5
1988/89 ^u	0.0	*	*	*	*	1,087.9	552.8	Closed	Closed	Closed	0.0	0.0	1,646.3
1989/90 ^u	*	*	7.6	2.1	*	1,233.4	740.7	Closed	Closed	Closed	Closed	Closed	1,994.5
1990/91	Closed	Closed	Closed	Closed	Closed	1,598.8	642.8	Closed	Closed	Closed	Closed	Closed	2,241.6
1991/92 ^u	Closed	Closed	Closed	Closed	Closed	1,727.2	381.5	Closed	Closed	Closed	Closed	Closed	2,108.6

* Where numbers of vessels participating is three or less, information is confidential.

^u Exploratory deep water Tanner (*Chioniceetes tanneri*) opened September 16 through October 31, 1983, and December 5 to January 24, 1984.

^v Exploratory Tanner open in Districts 1 through 4 opened March 25, 1986, and closed May 1, 1986.

^u Experimental Tanner areas opened July 1, 1988, and closed January 31, 1989. Traditional fishery opened January 15, 1989, and closed February 16, 1989.

^u Experimental Tanner areas opened July 1, 1989, and closed January 31, 1990. Traditional fishery opened February 15, 1990, and closed March 8, 1990.

^u Most recent year's data is considered preliminary.

Table 3. Statistical Area A (Southeast Alaska) commercial Tanner crab, harvest in thousands of pounds, by district and season, 1968/69 to present.

Season	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
1968/69	0.0	0.0	0.0	0.0	0.0	0.0	*	81.3	2.1	63.1	9.2	0.0	8.0	4.8	*	0.0	176.6
1969/70	0.0	0.0	0.0	0.0	0.0	*	0.0	78.4	0.0	179.0	227.6	4.8	28.6	96.9	44.4	0.0	660.3
1970/71	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	31.7	*	75.7	*	*	0.0	*	0.0	167.4
1971/72	0.0	0.0	0.0	0.0	0.0	0.6	0.0	71.6	*	69.6	71.0	*	99.7	310.8	*	0.0	656.7
1972/73	0.0	0.0	0.0	0.0	0.0	37.5	0.0	69.2	*	55.0	436.9	*	58.3	505.2	*	318.4	1,600.7
1973/74	0.0	0.0	0.0	0.0	*	18.8	*	*	46.1	132.8	616.2	*	60.8	404.3	1.5	0.0	1,309.7
1974/75	3.5	0.0	0.0	0.0	0.0	*	10.6	22.0	40.0	67.3	211.2	3.6	100.7	371.1	8.4	*	863.8
1975/76	0.0	0.0	0.0	0.0	14.3	*	11.3	112.8	*	138.0	828.6	92.5	176.3	505.1	*	0.0	2,149.4
1976/77	0.0	0.0	*	0.0	71.8	115.3	0.0	104.0	62.6	217.5	694.4	52.7	92.8	1,032.4	113.6	0.0	2,557.4
1977/78	*	0.0	*	0.0	*	124.6	0.0	*	*	212.6	580.3	96.6	86.6	762.5	191.1	0.0	2,142.4
1978/79	*	0.0	0.0	0.0	*	*	0.0	*	0.0	303.5	425.6	3.6	55.0	655.0	72.2	0.0	1,559.8
1979/80	0.0	0.0	0.0	0.0	0.0	5.9	15.6	118.2	*	237.2	749.4	22.0	*	390.5	125.6	*	1,772.9
1980/81	*	0.0	0.0	*	*	20.3	*	229.1	49.0	282.2	422.2	83.5	53.9	672.8	77.3	58.4	2,010.4
1981/82	*	0.0	0.0	0.0	0.0	121.4	41.8	201.2	0.0	167.4	405.0	78.5	66.0	2,102.8	122.2	0.0	3,302.2
1982/83	*	0.0	0.0	0.0	*	45.2	0.0	0.0	*	171.3	108.2	26.3	*	834.9	25.9	0.0	1,222.2
1983/84 ^v	0.0	0.0	0.0	*	*	42.0	29.1	46.4	28.9	205.4	375.6	16.5	51.2	656.5	145.8	*	1,615.1
1984/85	*	0.0	0.0	0.0	*	7.8	14.3	40.6	36.9	136.7	368.3	66.9	44.7	225.0	182.8	0.0	1,125.2
1985/86 ^v	*	0.0	0.0	0.0	*	16.7	3.7	22.4	12.4	74.9	474.6	39.7	46.5	182.3	128.5	0.0	1,006.7
1986/87	0.0	0.0	0.0	0.0	*	31.5	0.0	40.2	32.7	81.1	526.6	34.6	44.2	242.0	80.4	*	1,124.0
1987/88	*	0.0	0.0	0.0	*	46.7	*	29.7	20.3	218.6	541.9	59.4	*	239.2	127.7	*	1,330.5
1988/89 ^v	0.0	0.0	0.0	0.0	*	29.1	*	54.9	29.4	326.8	622.5	91.4	*	349.1	106.0	0.0	1,646.3
1989/90 ^v	*	0.0	0.0	0.0	0.4	25.4	0.0	24.2	153.2	446.0	613.0	38.4	41.9	621.3	29.6	0.0	1,994.5
1990/91	0.0	0.0	0.0	0.0	*	36.0	0.0	41.0	237.2	302.1	695.2	63.9	*	798.5	22.4	*	2,241.6
1991/92 ^v	0.0	0.0	0.0	0.0	*	67.4	0.0	46.4	64.5	204.3	744.7	71.5	*	822.6	64.0	0.0	2,108.6

* Where numbers of vessels participating is three or less, information is confidential.

^v Exploratory deep water Tanner (*Chioniceetes tanneri*) opened September 16 through October 31, 1983, and December 5 to January 24, 1984.

^v Exploratory Tanner in Districts 1 through 4 opened March 25, 1986, and closed May 1, 1986.

^v Experimental Tanner areas opened July 1, 1988, and closed January 31, 1989. Traditional fishery opened January 15, 1989, and closed February 16, 1989.

^v Experimental Tanner areas opened July 1, 1989, and closed January 31, 1990. Traditional fishery opened February 15, 1990, and closed March 8, 1990.

^v Most recent year's data should be considered preliminary.

Table 4. Southeast Alaska (Statistical Area A) summary of commercial Tanner crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.^{1/}

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{2/}	% Postrecruits ^{3/}
1970/71	1	99	157.0	137 - 177	68.4	31.6
1971/72	3	235	149.8	121 - 183	67.1	32.9
1972/73	3	429	156.9	128 - 183	73.4	26.6
1973/74	9	1,658	153.0	111 - 190	68.7	31.3
1974/75	6	616	157.4	127 - 190	64.2	35.8
1975/76	15	1,663	154.1	116 - 190	62.4	37.6
1976/77	28	3,753	154.5	124 - 192	53.3	46.7
1977/78	36	4,786	155.3	124 - 192	25.4	74.6
1978/79	28	3,273	154.9	129 - 198	44.4	55.6
1979/80	43	4,509	154.6	128 - 193	63.0	37.0
1980/81	43	4,223	152.3	125 - 192	70.0	30.0
1981/82	59	6,556	149.7	129 - 193	67.6	32.4
1982/83	55	5,808	151.3	123 - 185	74.6	25.4
1983/84	24	2,444	152.0	135 - 187	76.2	23.8
1984/85	24	3,211	152.2	135 - 197	77.1	22.9
1985/86	50	5,453	151.0	128 - 191	75.6	24.4
1986/87	62	6,984	152.2	133 - 188	72.8	27.2
1987/88	106	10,933	150.8	134 - 186	67.7	32.3
1988/89	45	10,030	152.8	133 - 194	58.4	41.6
1989/90	122	12,806	150.8	129 - 185	63.7	36.3
1990/91	124	13,050	152.2	131 - 193	74.2	25.8
1991/92	112	11,568	155.0	129 - 190	58.3	41.7

^{1/} Summary tables of all dockside sampling data includes data from Tables 8, 10, and 12 plus data collected that could not be assigned to a fishing area.

^{2/} Recruits = all new and soft shell crab ≥ 140 mm and ≤ 164 mm carapace width.

^{3/} Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old shell crab ≥ 140 mm carapace width.

Table 5. Southeast Tanner Crab harvest in pounds by season by fishing area.

Season	Lynn Canal/Upper Stephens Passage ^{1/}		Icy Strait ^{2/}		Frederick Sound/Lower Stephens Passage ^{3/}		Other ^{4/}		Total Harvest
	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	Pounds	% of S.E. Harvest	
1971/72	13,440	2.05	310,803	47.33	200,854	30.59	131,564	20.03	656,661
1972/73	177,661	11.10	505,203	31.56	443,106	27.68	474,778	29.66	1,600,748
1973/74	377,190	28.80	404,347	30.87	396,400	30.27	131,736	10.06	1,309,673
1974/75	19,116	2.21	371,050	42.96	289,758	33.55	183,827	21.28	863,751
1975/76	782,127	36.39	505,089	23.50	406,565	18.92	455,616	21.19	2,149,397
1976/77	599,719	23.45	1,032,391	40.37	529,849	20.72	395,470	15.46	2,557,429
1977/78	394,041	18.39	762,491	35.59	648,802	30.28	337,075	15.74	2,142,409
1978/79	308,765	19.80	655,043	42.00	511,769	32.81	84,192	5.39	1,559,769
1979/80	330,221	18.63	390,460	22.02	899,658	50.74	152,591	8.61	1,772,930
1980/81	321,594	16.00	672,310	33.44	641,945	31.93	374,521	18.63	2,010,370
1981/82	380,304	11.52	2,102,755	63.68	428,259	12.97	390,893	11.83	3,302,211
1982/83	96,505	7.90	834,884	68.31	208,918	17.09	81,898	6.7	1,222,205
1983/84	298,975	18.51	656,496	40.65	450,204	27.87	209,425	12.97	1,615,100
1984/85	362,713	32.24	225,044	20.0	361,611	32.14	175,845	15.62	1,125,213
1985/86	420,258	41.74	182,316	18.11	281,531	28.0	122,649	12.15	1,006,754
1986/87	410,674	36.54	242,010	21.53	317,528	28.25	153,762	13.68	1,123,974
1987/88	458,190	34.44	239,194	17.98	459,709	34.55	173,392	13.03	1,330,485
1988/89	476,600	28.95	349,098	21.20	630,687	38.31	189,947	11.54	1,646,332
1989/90	386,754	19.39	621,277	31.15	710,551	35.63	275,914	13.83	1,994,496
1990/91	442,952	19.76	798,460	35.62	617,839	27.56	382,342	17.06	2,241,593
1991/92	617,235	29.27	822,562	39.01	442,200	20.97	226,640	10.75	2,108,637

^{1/} Includes all of District 115 and District 111-30 through 111-99.

^{2/} Includes all of District 114.

^{3/} Includes all of District 110, District 111-01 through 111-29 and District 108-40 through 108-69.

^{4/} Includes all of Southeast Alaska outside of Lynn Canal Upper/Stephens Passage, Icy Strait, and Frederick Sound/Lower Stephens Passage.

Table 6. Southeast Alaska (Statistical Area A) summary of commercial Tanner crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.^{1/}

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested ^{2/}	Percent of Harvest Sampled ^{3/}
						Average	Range		
1970/71									
1971/72									
1972/73									
1973/74									
1974/75	1					3.22	3.22 - 3.22		
1975/76									
1976/77	18	58	1,400	24.14	24.14 - 24.14	2.58	2.23 - 2.98	991,252	0.38
1977/78	27	270	6,268	25.20	16.00 - 43.11	2.68	2.27 - 3.11	799,406	0.60
1978/79	12	386	5,469	19.80	17.18 - 22.42	2.60	1.59 - 2.85	599,911	0.55
1979/80	3	160	1,643	10.27	10.27 - 10.27	2.80	2.80 - 2.80	636,401	0.71
1980/81	5	300	4,560	15.20	15.20 - 15.20	2.80	2.06 - 3.20	717,989	0.59
1981/82	33	6,277	132,535	26.20	5.27 - 71.55	2.33	2.01 - 2.55	1,419,396	0.46
1982/83	39	2,043	26,152	15.00	4.91 - 29.16	2.45	2.06 - 2.97	498,859	1.16
1983/84	16	620	6,050	10.45	6.89 - 14.00	2.50	2.30 - 2.72	653,343	0.37
1984/85	22	2,070	25,455	11.61	3.89 - 17.36	2.60	2.26 - 3.04	435,685	0.74
1985/86	51	7,127	75,552	12.69	1.78 - 30.71	2.43	1.80 - 3.10	414,705	1.32
1986/87	59	14,192	135,615	12.28	2.87 - 31.96	2.49	2.13 - 2.85	451,395	1.55
1987/88	95	22,745	225,850	11.70	2.40 - 32.95	2.38	1.96 - 2.71	559,027	2.00
1988/89	99	26,387	350,878	15.17	0.40 - 32.95	2.51	2.12 - 3.11	655,909	1.53
1989/90	109	31,517	366,514	11.71	1.03 - 34.62	2.45	2.12 - 2.95	814,080	1.57
1990/91	122	39,168	568,956	15.25	1.27 - 40.34	2.57	2.11 - 3.05	872,215	1.50
1991/92	105	32,421	354,003	11.73	0.34 - 30.00	2.67	2.11 - 3.07	789,752	1.46

^{1/} Summary tables of all dockside sampling data includes data from Tables 7, 9, and 11 plus data collected that could not be assigned to a fishing area.

^{2/} Calculated by dividing fish ticket weight data from Table 5 by dockside sampling average weight per crab data.

^{3/} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

Table 7. Icy Strait summary of commercial Tanner crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested ^{1/}	Percent of Harvest Sampled ^{2/}
						Average	Range		
1970/71									
1971/72									
1972/73									
1973/74									
1974/75									
1975/76	2					1.86	1.67 - 2.09	271,553	0.0
1976/77	2					2.10	1.97 - 2.24	491,615	0.0
1977/78	2					2.82	2.78 - 2.86	270,387	0.31
1978/79									
1979/80									
1980/81									
1981/82	21	5,074	118,704	29.51	5.27 - 71.55	2.31	2.01 - 2.55	910,284	0.30
1982/83	34	1,556	22,758	18.37	4.91 - 29.16	2.46	2.06 - 2.76	339,384	0.98
1983/84	8					2.52	2.35 - 2.67	260,514	0.31
1984/85	2					2.30	2.30 - 2.30	97,845	0.32
1985/86	1	98	811	8.28	8.28 - 8.28				
1986/87	4	1,087	11,342	12.11	6.04 - 20.77	2.37	2.28 - 2.51	102,114	0.47
1987/88	10	2,712	27,371	10.90	4.29 - 25.00	2.24	2.11 - 2.44	106,783	1.05
1988/89	17	5,812	69,339	13.30	0.40 - 26.72	2.28		153,113	1.22
1989/90	25	8,812	113,893	13.26	4.17 - 34.62	2.50	2.35 - 2.65	248,511	1.04
1990/91	34	11,683	153,781	14.08	4.24 - 40.34	2.42	2.33 - 2.57	329,942	1.05
1991/92	26	8,901	106,340	11.81	1.00 - 21.54	2.73	2.56 - 2.94	301,305	0.98

^{1/} Calculated by dividing fish ticket weight data for Icy Strait from Table 5, by dockside sampling average weight per crab data.

^{2/} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

Table 8. Icy Strait summary of commercial Tanner crab length frequency and shell condition data collected during dockside sampling, 1970-71 to present.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{1/}	% Postrecruits ^{2/}
1970/71						
1971/72	1	87	154.0	127 - 183	75.6	24.4
1972/73						
1973/74						
1974/75						
1975/76						
1976/77 ^{3/}	1	101	155.2	140 - 179	76.2	23.8
1977/78	4	828	157.6	126 - 190	22.3	77.7
1978/79						
1979/80	2	207	152.6	138 - 179	67.5	32.5
1980/81	23	2,863	148.8	130 - 181	67.4	32.6
1981/82	22	2,759	148.8	130 - 181	66.5	33.5
1982/83	32	3,317	151.0	123 - 178	74.7	25.3
1983/84	8	803	152.4	137 - 181	68.2	31.8
1984/85	2	309	146.6	136 - 165	55.8	44.2
1985/86	1	118	148.3	138 - 180	82.7	17.3
1986/87	4	485	148.4	136 - 176	42.8	57.2
1987/88	11	1,118	149.4	137 - 184	66.8	33.2
1988/89	18	1,875	151.8	135 - 184	64.9	35.1
1989/90	25	2,576	151.1	135 - 183	69.8	30.2
1990/91	33	3,472	150.0	132 - 180	83.9	16.1
1991/92	27	2,943	155.1	132 - 189	67.3	32.7

^{1/} Recruits = all new and soft shell crab ≥ 140 mm and ≤ 164 mm carapace width.

^{2/} Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old crab ≥ 140 mm carapace width.

^{3/} The first season that legal size was 5 1/2" (140 mm) carapace width.

Table 9. Lynn Canal/Stephens Passage summary of commercial Tanner crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested ^{1/}	Percent of Harvest Sampled ^{2/}
						Average	Range		
1970/71									
1971/72									
1972/73									
1973/74									
1974/75									
1975/76									
1976/77	10	58	1,400	24.14	24.14 - 24.14	2.62	2.45 - 2.98	228,900	1.10
1977/78	8	270	6,268	252	16.00 - 43.11	2.70	2.57 - 2.86	145,941	0.95
1978/79	6	386	5,469	19.8	17.18 - 22.42	2.68	2.56 - 2.80	115,211	1.05
1979/80	1	160	1,643	10.27	10.27 - 10.27				
1980/81									
1981/82	4	762	8,744	12.12	12.08 - 12.16	2.35	2.31 - 2.40	161,831	0.32
1982/83	8	487	3,394	10.51	5.50 - 13.72	2.41	2.37 - 2.50	39,911	3.25
1983/84	2					2.60	2.49 - 2.72	114,524	0.18
1984/85	6	875	8,832	10.21	3.89 - 14.00	2.59	2.49 - 2.72	140,044	0.60
1985/86	29	3,577	48,103	15.20	5.92 - 30.71	2.43	1.80 - 3.10	172,946	1.83
1986/87	37	5,000	64,115	13.97	4.95 - 31.96	2.53	2.13 - 2.79	161,032	2.78
1987/88	43	7,507	80,893	12.64	3.01 - 32.95	2.43	1.96 - 2.71	183,247	2.89
1988/89	41	7,355	94,795	14.17	4.49 - 37.36	2.63	2.21 - 3.11	178,389	2.01
1989/90	33	7,509	89,562	11.61	3.12 - 32.40	2.51	2.12 - 2.84	152,984	2.58
1990/91	14	2,555	28,802	12.19	1.95 - 25.26	2.60	2.45 - 2.81	168,434	0.63
1991/92	35	6,481	89,249	15.33	0.34 - 30.00	2.73	2.23 - 3.07	224,686	1.70

^{1/} Calculated by dividing fish ticket weight data for Lynn Canal/Stephens Passage from Table 5, by dockside sampling average weight per crab data.

^{2/} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

Table 10. Lynn Canal/Stephens Passage summary of commercial Tanner crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{1/}	% Postrecruits ^{2/}
1970/71	1	99	157.0	137 - 177	68.4	31.6
1971/72						
1972/73						
1973/74						
1974/75						
1975/76	5	655	155.5	126 - 182	47.6	52.4
1976/77 ^{3/}	15	2,521	154.7	124 - 191	45.5	54.5
1977/78	10	1,382	155.7	131 - 187	20.2	79.8
1978/79	9	1,213	154.7	129 - 191	53.4	46.6
1979/80	5	555	153.3	128 - 186	74.8	25.2
1980/81	4	155	149.9	136 - 182	36.4	63.6
1981/82	5	518	151.4	131 - 193	71.1	28.9
1982/83	12	1,296	151.2	135 - 177	79.0	21.0
1983/84	2	204	153.8	139 - 177	67.0	33.0
1984/85	8	845	153.5	136 - 183	75.5	24.5
1985/86	29	3,166	151.6	135 - 191	72.4	27.6
1986/87	40	4,473	152.9	133 - 188	72.1	27.9
1987/88	52	5,300	151.9	135 - 185	71.5	28.5
1988/89	33	3,592	154.7	133 - 194	75.2	24.8
1989/90	35	3,945	151.9	129 - 185	69.1	30.9
1990/91	10	1,053	155.2	138 - 188	69.1	30.9
1991/92	37	3,796	156.7	129 - 190	51.2	48.8

^{1/} Recruits = all new and soft shell crab ≥ 151 mm and ≤ 164 mm carapace length.

^{2/} Postrecruits = all new and soft shell crab ≥ 168 mm and ≤ 184 mm, and old and very old shell crab ≥ 151 mm and ≤ 167 mm, carapace length.

^{3/} The first season that the regulatory size was 5 1/2" (140 mm) carapace width.

Table 11. Frederick Sound summary of commercial Tanner crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested ^{1/}	Percent of Harvest Sampled ^{2/}
						Average	Range		
1970/71									
1971/72									
1972/73									
1973/74									
1974/75	1					3.22	3.22 - 3.22		
1975/76									
1976/77	4					2.60	2.40 - 2.79		
1977/78	14					2.74	2.51 - 3.11		
1978/79	5					2.50	1.59 - 2.85		
1979/80	1					2.80	2.80 - 2.80		
1980/81									
1981/82	5					2.42	2.20 - 2.54	176,967	1.16
1982/83	4					2.66	2.35 - 2.97	78,541	0.10
1983/84	4					2.42	2.30 - 2.56	186,035	0.45
1984/85	7					2.72	2.26 - 3.04	132,945	0.80
1985/86	15	2,879	21,651	6.62	1.78 - 10.03	2.46	2.10 - 2.72	114,399	1.33
1986/87	10	3,423	36,051	11.71	2.87 - 22.22	2.48	2.13 - 2.85	128,035	0.90
1987/88	22	7,478	67,096	10.26	2.40 - 26.00	2.39	2.17 - 2.58	190,676	1.23
1988/89	30	8,957	150,506	18.78	4.48 - 42.74	2.44	2.25 - 2.75	242,605	1.42
1989/90	42	13,577	149,824	10.91	1.03 - 30.00	2.45	2.16 - 2.95	268,599	1.71
1990/91	35	13,188	209,884	16.12	5.71 - 38.64	2.63	2.12 - 2.99	230,171	1.78
1991/92	27	10,567	93,789	8.39	0.70 - 20.00	2.68	2.34 - 2.98	158,191	1.64

^{1/} Calculated by dividing fish ticket weight data for Frederick Sound from Table 5, by dockside sampling average weight per crab data.

^{2/} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

Table 12. Frederick Sound summary of commercial Tanner crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{1/}	% Postrecruits ^{2/}
1970/71						
1971/72	2	148	147.4	121 - 180	60.0	40.0
1972/73	3	429	156.9	128 - 183	73.4	26.6
1973/74	9	1,658	153.0	111 - 190	68.7	31.3
1974/75	4	412	158.8	127 - 190	58.7	41.3
1975/76	3	304	154.3	135 - 183	75.3	24.7
1976/77 ^{3/}	8	820	155.3	129 - 192	67.7	32.3
1977/78	16	1,862	156.2	124 - 192	33.3	66.7
1978/79	17	1,851	155.5	131 - 198	42.3	57.7
1979/80	36	3,747	154.9	134 - 193	61.0	39.0
1980/81	30	3,081	153.0	125 - 192	68.9	31.1
1981/82	20	2,046	150.9	130 - 188	63.8	36.2
1982/83	8	785	153.4	135 - 185	70.2	29.8
1983/84	8	839	152.4	135 - 187	80.6	19.4
1984/85	8	1,068	155.2	135 - 197	67.7	32.3
1985/86	14	1,524	151.5	131 - 188	80.0	20.0
1986/87	10	1,150	151.8	136 - 187	81.3	18.7
1987/88	23	2,338	150.3	135 - 186	65.6	34.4
1988/89	33	3,434	151.9	133 - 182	44.3	55.7
1989/90	45	4,586	150.9	132 - 185	60.0	40.0
1990/91	40	4,086	153.6	131 - 193	70.4	29.6
1991/92	26	2,593	154.6	134 - 189	60.1	39.9

^{1/} Recruits = all new and soft shell crab ≥ 140 mm and ≤ 164 mm carapace width.

^{2/} Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old crab ≥ 140 mm carapace width.

^{3/} The first season that the regulatory legal size was 5 1/2" (140 mm) carapace width.

REPORT TO THE BOARD OF FISHERIES
1991/92 YAKUTAT TANNER CRAB FISHERIES



By

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Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska

December 1992

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GENERAL BACKGROUND

Of the two commercially significant species of Tanner crab (*Chionoecetes bairdi* and *C. opilio*) harvested from Alaskan waters, only *C. bairdi* is known to be present in Statistical Area D (Yakutat) of Region 1 (Figure 1). Any subsequent reference to Tanner crab in this report will be to *C. bairdi*.

This fishery for Tanner crab is based on the harvest of males over 5 1/2 inches (140 mm) carapace width during a season that is intended to protect sensitive life history stages such as the molting and mating periods. In addition, a guideline harvest ceiling of 1,000,000 lbs, based on historic harvest trends, has been established for this area.

The Yakutat fishery is conducted on the open waters of the eastern Gulf of Alaska, generally along the exposed coasts, out to about the 100 fathom contour. The area is divided into Districts 181 to 191, located generally east to west, and it is a nonexclusive registration area. Vessels registering to fish Tanner crabs in Area D can later register to fish in other nonexclusive areas during the same registration year (August 1 - July 31). In recent years, the season has opened on January 15 and has usually closed by regulation on May 1. Statistical Area D is open to entry by new participants.

Historical Review

It was not until the early 1970's that significant Tanner crab fisheries developed in the Yakutat area (Table 1). As the demand for Tanner crab slowly grew, landings from the Yakutat area also rose, averaging about 1,500,000 lbs per season between the 1972/73 and 1979/80 seasons. Following the record 2,400,000 lb catch during the 1979/80 season the harvest steadily declined. Peak catches consistently occurred between the months of February and April (Table 2), although the season extended from September 1 to May 15 during most of the early years of the fishery.

During the 1970's, this fishery attracted large, long-ranging vessels with live tanks in which many tons of crabs could be kept alive for extended periods. Landings from this period suggest that much of area was heavily fished (Table 3). Many vessels also participated in shellfish fisheries in other areas of Alaska.

The stocks could not sustain the levels of harvest of the late 1970s and crashed between the 1979/80 and 1980/81 seasons. The early 1980s saw the use of side-loading pots prohibited, the starting date of the season changed to mid-winter, and a continued decline in the number of vessels, the catch per vessel, and

the total catch. Many of the larger vessels left the fishery. Those remaining were forced to switch to top-loading conical or pyramidal pots. By 1984 and 1985, only small, local vessels, operated by residents of Yakutat, were participating in this fishery. Reported landings were limited to the immediate vicinity of Yakutat Bay (Table 3).

In 1986, two larger crabbers entered the fishery along with the Yakutat vessels. The larger vessels experienced uniformly poor catches despite extensive exploratory fishing. In 1987, five large vessels based in Kodiak, Valdez, and Pelican registered for the fishery, along with the local fleet in Yakutat. Only two of the larger vessels actively participated in the fishery, and their disappointing landings discouraged the remaining three from entering the fishery. In 1988, only one large vessel and several of the smaller vessels fishing around Yakutat Bay reported any landings.

In 1989, one large vessel and several of the smaller vessels based in Yakutat reported landings from the Yakutat area. Much of the detailed data from this fishery is considered confidential because of the few vessels that fish in this area.

After the 1988/89 season, only a few local vessels, limited to the waters of Yakutat Bay, have participated in the fishery. By all indications, the Tanner crab stocks in the Yakutat area have not recovered since the crash in the early 1980s, continue to show signs of severe depletion, and exhibit no indication of imminent recovery.

Management Strategy for the Yakutat Fishery

The Yakutat Tanner fishery remains open simply to provide an indication of stock status. The persistent low catches, small average size, and poor shell condition of the small numbers of sampled crab suggest that at least a partial closure of this fishery may be justified as a preliminary step in rebuilding the local stocks. Particularly during the past two seasons, indicators suggest that the stocks are in poorer condition than they have been in a number of years and a closure should be seriously considered.

Season Summary

During the 1991/92 season that lasted from January 15 through May 15, 1992, a total of four vessels, only one of which was large enough to access all the fishing grounds, harvested 37,347 lbs of Tanner crab in

the Yakutat area. As in the past, the major portion of the catch was reported from waters between the Yakutat Forelands and Icy Bay.

Port sampling for Tanner crab from the Yakutat area is very limited. The landings are sporadic and occur in remote ports, such as Pelican, or at times when department personnel are rarely able to sample them. In general, samples available from past seasons suggest that Yakutat crab are generally smaller in average size than crab from Statistical Area A (Tables 4 and 5). There has also been a high incidence of skip-molt crab in catches from the Yakutat area in recent seasons. Skip-molt crabs may indicate poor habitat conditions. Samples from the past two seasons suggest recruitment failure during both seasons. The greater than average size and weight of sampled crabs may be primarily a result of harvest of larger postrecruit crabs, many of which were skip-molts that had held over for more than two seasons.

Table 1. Statistical Area D (Yakutat) commercial Tanner crab catches in pounds, number of vessels, pounds per vessel, number of landings and pounds per landing, 1961 to present.

Season	Catch in Pounds	Number of Vessels	Pounds Per Vessel	Number of Landings	Pounds Per Landing
1961	-	-			
1962	-	-			
1963	-	-			
1964	-	-			
1965	-	-			
1966	-	-			
1967	-	-			
1968/69	-	-			
1969/70	-	-			
1970/71	-	-			
1971/72	-	-			
1972/73	222,441	7	31,777	22	10,110
1973/74	1,872,357	11	170,214	110	17,021
1974/75	1,972,752	13	151,750	60	32,879
1975/76	1,762,589	5	352,518	35	50,359
1976/77	966,650	7	138,093	15	64,443
1977/78	1,003,116	8	125,390	103	9,738
1978/79	1,691,941	15	112,796	107	15,812
1979/80	2,435,123	23	105,875	114	21,360
1980/81	642,608	14	45,901	84	7,650
1981/82	71,302	7	10,186	32	2,228
1982/83	151,621	10	15,162	55	2,756
1983/84	11,142	4	2,786	13	857
1984/85	3,665	5	733	15	244
1985/86	2,379	5	476	9	264
1986/87	*	*	*	*	*
1987/88	*	*	*	*	*
1988/89	155,528	5	31,106	23	6,762
1989/90	76,816	5	15,363	27	2,845
1990/91	41,709	6	6,952	42	993
1991/92 ^u	37,347	4	9,337	27	1,556

^u Most recent year's data should be considered preliminary.

* Where numbers of vessels participating is three or less, information is confidential.

Table 2. Statistical Area D (Yakutat) commercial Tanner crab harvest in thousands of pounds by month and season, 1968 to present.

Season	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
1968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	*	*	0.0	0.0	0.0	0.0	*	*	*	0.0	*	222.4
1973/74	0.0	0.0	0.0	0.0	*	*	313.8	990.2	558.0	Closed	Closed	Closed	1,872.4
1974/75	0.0	0.0	0.0	0.0	*	*	592.1	839.4	481.9	Closed	Closed	Closed	1,972.8
1975/76	0.0	0.0	0.0	*	*	*	661.8	456.7	*	Closed	Closed	Closed	1,762.6
1976/77	0.0	0.0	0.0	0.0	*	*	486.1	*	0.0	Closed	Closed	Closed	966.7
1977/78	0.0	*	14.5	31.6	161.7	206.0	254.2	279.0	53.1	Closed	Closed	Closed	1,003.1
1978/79	*	*	0.0	*	63.7	185.1	412.8	766.3	238.1	Closed	Closed	Closed	1,691.9
1979/80	0.0	10.2	16.4	27.9	56.9	524.1	1,220.9	578.7	Closed	Closed	Closed	Closed	2,435.1
1980/81	0.0	0.0	0.0	*	6.2	181.9	392.7	60.8	0.0	Closed	Closed	Closed	642.6
1981/82	Closed	Closed	Closed	Closed	0.0	0.0	16.4	47.1	7.8	Closed	Closed	Closed	71.3
1982/83	Closed	Closed	Closed	Closed	Closed	50.2	73.9	27.5	0.0	Closed	Closed	Closed	151.6
1983/84	Closed	Closed	Closed	Closed	Closed	*	5.8	3.6	0.0	Closed	Closed	Closed	11.1
1984/85	Closed	Closed	Closed	Closed	0.0	0.0	0.0	3.7	0.0	Closed	Closed	Closed	3.7
1985/86	Closed	Closed	Closed	Closed	*	*	1.1	*	0.0	Closed	Closed	Closed	2.4
1986/87	Closed	Closed	Closed	Closed	0.0	*	*	*	*	Closed	Closed	Closed	*
1987/88	Closed	Closed	Closed	Closed	0.0	*	*	*	*	Closed	Closed	Closed	*
1988/89	Closed	Closed	Closed	Closed	*	*	70.3	36.8	47.1	Closed	Closed	Closed	155.5
1989/90	Closed	Closed	Closed	Closed	2.7	29.2	37.5	7.4	0.0	Closed	Closed	Closed	76.8
1990/91	Closed	Closed	Closed	Closed	3.0	8.7	14.1	15.9	0.0	Closed	Closed	Closed	41.7
1991/92 ^v	Closed	Closed	Closed	Closed	0.0	17.6	13.4	5.8	0.0	Closed	Closed	Closed	37.3

^v Most recent year's data should be considered preliminary.

* Where numbers of vessels participating is three or less, information is confidential.

Table 3. Statistical Area D (Yakutat) commercial Tanner crab, harvest in thousands of pounds by district and season, 1968/69 to present.

Season	District						Total
	181	183	184	186	189	191	
1968/69	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970/71	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971/72	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972/73	*	102.2	*	*	0.0	0.0	222.4
1973/74	619.4	518.6	215.6	518.3	0.0	0.0	1,872.4
1974/75	1,135.1	193.7	118.7	*	0.0	428.0	1,972.8
1975/76	*	*	*	753.1	0.0	*	1,762.6
1976/77	0.0	452.7	167.8	346.2	0.0	0.0	966.7
1977/78	0.0	1,003.1	0.0	0.0	0.0	0.0	1,003.1
1978/79	0.0	350.9	589.2	207.9	0.0	544.0	1,692.0
1979/80	720.8	216.2	198.5	461.4	0.0	838.2	2,435.1
1980/81	*	158.6	123.2	78.3	0.0	262.3	642.6
1981/82	0.0	51.2	0.0	0.0	*	*	71.3
1982/83	61.2	83.8	*	*	0.0	4.5	151.6
1983/84	0.0	11.1	0.0	0.0	0.0	0.0	11.1
1984/85	0.0	3.7	0.0	0.0	0.0	0.0	3.7
1985/86	0.0	2.4	0.0	0.0	0.0	0.0	2.4
1986/87	*	*	0.0	0.0	0.0	0.0	*
1987/88	0.0	*	0.0	0.0	0.0	*	*
1988/89	*	*	0.0	0.0	*	*	155.6
1989/90	27.9	*	0.0	0.0	0.0	*	76.8
1990/91	16.2	25.6	0.0	0.0	0.0	0.0	41.7
1991/92 ^u	*	11.8	0.0	*	0.0	0.0	37.3

^u Most recent year's data should be considered preliminary.

* Where numbers of vessels participating is three or less, information is confidential.

Table 4. Yakutat summary of commercial Tanner crab length frequency and shell condition data collected during dockside sampling, 1970/71 to present.

Accounting Year	Number of Boats Sampled	Number of Crab Sampled	Carapace Width (mm)		Recruitment	
			Average	Range	% Recruits ^{1/}	% Postrecruits ^{2/}
1970/71						
1971/72						
1972/73						
1973/74						
1974/75	3	516	141.4	110 - 174	87.3	12.7
1975/76	11	1,079	140.7	96 - 179	39.3	60.7
1976/77 ^{3/}						
1977/78	9	2,256	145.1	122 - 171	65.0	35.0
1978/79	15	1,616	147.8	128 - 172	57.3	42.7
1979/80	22	2,509	147.3	131 - 174	22.5	77.5
1980/81	22	2,505	147.3	107 - 172	2.7	97.3
1981/82	1	99	146.6	137 - 165	75.0	25.0
1982/83	17	1,894	145.9	131 - 173	81.9	18.1
1983/84	1	100	149.9	139 - 170	44.9	55.1
1984/85						
1985/86						
1986/87	4	520	144.0	130 - 166	14.3	85.7
1987/88	2	548	145.4	136 - 169	59.2	40.8
1988/89	6	611	148.4	135 - 177	35.8	64.2
1989/90	5	779	147.0	137 - 174	4.1	95.9
1990/91						
1991/92	4	565	148.5	137 - 178	8.7	91.3

^{1/} Recruits = all new and soft shell crab ≥ 140 mm and ≤ 164 mm carapace width.

^{2/} Postrecruits = all new and soft shell crab ≥ 165 mm and old and very old crab ≥ 140 mm carapace width.

^{3/} The first season that the regulatory legal size was 5 1/2" (140 mm) carapace width.

Table 5. Yakutat summary of commercial Tanner crab CPUE and average weight data collected during dockside sampling and interviews, 1970/71 to present.

Season	Number of Boats Interviewed	Number of Pots Lifted	Number of Crab Captured	Average Catch Per Pot	Range of Catch/Pot	Weight (lbs)		Estimated No. of Crab Harvested ^{1/}	Percent of Harvest Sampled ^{2/}
						Average	Range		
1970/71									
1971/72									
1972/73									
1973/74									
1974/75									
1975/76	11					1.86	1.67 - 2.09	947,628	0.11
1976/77 ^{3/}	2					2.10	1.97 - 2.24	460,310	
1977/78	4					2.22	2.01 - 2.51	451,854	0.50
1978/79	7	3,810	160,164	34.05	20.09 - 48.57	2.32	2.25 - 2.38	729,285	0.22
1979/80	21	8,802	322,624	40.85	7.69 - 79.02	2.25	2.13 - 2.38	1,082,277	0.23
1980/81	12	3,688	51,765	17.37	10.18 - 27.13	2.29	2.05 - 2.67	280,615	0.89
1981/82									
1982/83	16					2.08	1.91 - 2.21	72,895	2.60
1983/84									
1984/85	1					2.41	2.41 - 2.41	1,521	
1985/86									
1986/87	3	1,460	18,629	15.48	10.0 - 19.77				
1987/88	2	840	17,850	23.28	18.55 - 28.01	2.09	2.09 - 2.09		
1988/89	5	705	12,429	9.81	1.39 - 38.11	2.10	2.09 - 2.11	74,061	0.82
1989/90	4	142	1,621	11.32	7.87 - 16.25	2.19	2.12 - 2.30	35,076	2.22
1990/91									
1991/92	5	597	8,335	7.61	1.21 - 16.62	2.31	2.23 - 2.41	16,168	3.49

^{1/} Calculated by dividing fish ticket weight data by dockside sampling average weight per crab data.

^{2/} Calculated by dividing number of crab sampled for length frequency by estimated number of crab harvested.

^{3/} The first season that the regulatory legal size was 5 1/2" (140 mm) carapace width.

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